

**BEFORE THE DEPARTMENT OF
NATURAL RESOURCES AND CONSERVATION
OF THE STATE OF MONTANA**

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APPLICATION TO CHANGE WATER RIGHT) NO. 41H 30118754 BY SPAIN BRIDGE) MEADOWS, LLC)	PRELIMINARY DETERMINATION TO GRANT PERMANENT AND TEMPORARY CHANGE
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On February 28, 2019, Spain Bridge Meadows, LLC (Applicant) submitted Application to Change Water Right No. 41H 30118754 to change Water Right Claim Nos. 41H 132779 00, 41H 110340 00, 41H 110339 00, 41H 110338 00, 41H 110337 00, and 41H 110336 00 to the Bozeman Regional Office of the Department of Natural Resources and Conservation (Department or DNRC). The Department published receipt of the Application on its website. The Department sent Applicant a deficiency letter under §85-2-302, Montana Code Annotated (MCA), dated August 19, 2019. The Applicant responded with information dated November 15, 2019. The Application was determined to be correct and complete as of September 30, 2022.

The Department (Michael Everett, Water Resource Specialist) met with the Applicant (Steve Wallingford, Owner Spain Bridge Meadows, LLC) and Consultant (Meg Casey and Jeff Dunn, Trout Unlimited) on July 24, 2018, for a preapplication meeting. The Department (Kerri Strasheim, Regional Manager; Michael Everett, Water Resource Specialist; and Brent Zundel, Hydrologist) met with Meg Casey (Trout Unlimited) on 2/13/2019 for a preapplication meeting renewal. An Environmental Assessment for this Application was completed on January 23, 2023.

INFORMATION

The Department considered the following information submitted by the Applicant, which is contained in the administrative record.

Application as filed:

- Application to Change Water Right, Form 606 IR
- Change to Instream Flow Addendum, Form 606-IFA
- Change in Purpose Addendum, Form 606-PA
- Temporary Change Addendum, Form 606-TCA
- Attachments:
 - Attachment A. Figures of Cross Sections, Longitudinal Profiles and Photos for Each Site

- Attachment B. Cross Section and Longitudinal Profile Station and Elevation Data
 - Exhibit H. Thompson Irrigation Right Analysis
 - Exhibit I. Affidavit of Steve Wallingford
 - Exhibit J. Soil Maps and Soil Surveys
 - Exhibit K. Water Right Claims within Proposed Protected Reach
 - Exhibit L. Spain Bridge Meadows, NCAT Pump Analysis
 - Exhibit M. Groundwater Well Survey
 - Exhibit N. Spain Bridge Meadows Subdivision Phase 1 Plat Designs
 - Exhibit O. Consent to Change Water Rights Co-owned by Spain Bridge Meadows, LLC.
 - Exhibit P. Declaration of Protective Covenants and Restrictions for Spain Bridge Meadows Subdivision.
 - Exhibit Q. Land Management Plan for Spain Bridge Meadows Subdivision
- Maps:
 - Historic Use Map
 - Proposed Use Map
 - Aerial Photos: 1947, 1981, and 2014

Information Received after Application Filed

- Letter from Kirk and Karen Petrik Trustees, to DNRC dated January 6, 2023, Received by DNRC January 17, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 2 and Spain Bridge Meadows, LLC.
- Letter from Alex Ivanciu and Diana Florea to DNRC dated January 6, 2023, Received by DNRC January 17, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 3 and Spain Bridge Meadows, LLC.
- Letter from Paul Kemp to DNRC dated January 6, 2023, Received by DNRC January 11, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 4 and Spain Bridge Meadows, LLC.
- Letter from Sasan Hamidi and Kelly Liggan Hamidi Trustees to DNRC dated January 6, 2023, Received by DNRC January 11, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 5 and Spain Bridge Meadows, LLC.

- Letter from Trevor and Jennifer Adey to DNRC dated January 6, 2023, Received by DNRC January 17, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 6 and Spain Bridge Meadows, LLC.
- Letter from Jeff and Susan Kaufman to DNRC dated January 6, 2023, Received by DNRC January 11, 2023, Re: Consent to Change Water Rights co-owned by Owners of Spain Bridge Ranch Tract 7 and Spain Bridge Meadows, LLC.
- Email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated December 30, 2022, Re: SBM – ISF Operation Plan.
- Email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated January 3, 2023, Re: Major roadblock Spain Bridge Meadows.
- Email from DNRC (Gabrielle Ostermayer) to DNRC (Shannon Baumgardner and Kerri Strasheim) dated December 13, 2022, Re: Spain Bridge Meadows new ownership issue.
- Email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated October 31, 2022, Re: Protectable seepage and return flow receiving reaches .
- Email from DNRC (Gabrielle Ostermayer) to DNRC (Shannon Baumgardner) dated February 17, 2022, Re: Spain Bridge Meadows flow rate evidence.
- Email from DNRC (Gabrielle Ostermayer) to DNRC (Shannon Baumgardner) dated January 27, 2022, Re: Spain Bridge Change App questions & answers.
- Email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated June 15, 2021, Re: Kaufman deed.
- Email from Consultant (Meg Casey) to DNRC (Shannon Baumgardner) dated February 12, 2021, Re: East Gallatin Decrees, received by DNRC on February 12, 2021.
- Email from DNRC (Kerri Strasheim) to DNRC (James Ferch, Barbara Chillcott, and Nathaniel Ward) dated February 5, 2021, Re: Trout Unlimited instream flow change follow-up.
- Email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated January 6, 2021, Re: Spain Bridge Meadows – Correct & Complete.

Information within the Department's Possession/Knowledge

- Estimation of Physical Availability for South Fork Ross and Trout Creeks, Todd Blythe, Hydrologist, Water Management Bureau, April 24, 2022.

- Return Flow Report, Attila Felnagy, Groundwater Hydrologist, Water Management Bureau, May 12, 2022.
- Gallatin County Water Resources Survey, 1961.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at <http://websoilsurvey.nrcs.usda.gov/> accessed 5/6/2021.
- The Department also routinely considers the following information. The following information is not included in the administrative file for this Application but is available upon request. Please contact the Bozeman Regional Office at 406-586-3136 to request copies of the following documents.
 - Technical Memorandum: Distributing Conveyance Loss on Multiple User Ditches (Water Management Bureau, 2/14/2020)
 - Technical Memorandum: Calculating Return Flow (Levens et al., 4/18/2019)
 - Policy Memo – Return Flows (Davis, 4/1/2016)
 - Policy Memo – Change in Method of Irrigation (Davis, 12/2/2015)
 - Changes for Instream Flow Rights (Tubbs, 1/23/2008)

The Department has fully reviewed and considered the evidence and argument submitted in this Application and preliminarily determines the following pursuant to the Montana Water Use Act (Title 85, chapter 2, part 3, part 4, MCA).

WATER RIGHTS TO BE CHANGED

FINDINGS OF FACT

1. Applicant seeks to change the following Water Right Claims (Table 1), which each have a diverted volume not to exceed the amount put to historical and beneficial use from the East Gallatin River for the purpose of sprinkler irrigation:
 - a. 41H 110336 00 for 0.84 CFS flow rate with a priority date of 06/30/1868,
 - b. 41H 110337 00 for 4.92 CFS flow rate with a priority date of 06/01/1868,
 - c. 41H 110338 00 for 2.68 CFS flow rate with a priority date of 06/01/1868,
 - d. 41H 110339 00 for 2.08 CFS flow rate with a priority date of 06/01/1866,
 - e. 41H 110340 00 for 1.25 CFS flow rate with a priority date of 12/01/1876, and
 - f. 41H 132779 00 for 5.00 CFS flow rate with a priority date of 06/01/1868.

The period of use for 41H 110336 00, 41H 110337 00, 41H 110338 00, 41H 110339 00, and 41H 110340 00 is 05/01-10/31. The period of use for 41H 132779 00 is 05/01-11/01. All six water rights are entirely supplemental, and the place of use is 520.93 acres in S2NW, S2NE, NWSE, W2NESE, Government Lot 1, Government Lot 2, Government Lot 3, and Government Lot 4, Section 3; S2NE, Government Lot 1, Government Lot 2, Section 4; all in Township 1 South ("T1S"), Range 5 East ("R5E"), Gallatin County¹. The point of diversion for all six water rights is a headgate in the NWSWSE Section 10, T1S, R5E, Gallatin County. The water rights are conveyed from the claimed point of diversion by the Flannery Ditch, but further down ditch are conveyed to the place of use by a combination of the Flannery and Arnold Ditches. The place of use is 3 miles east of Belgrade. See Figure 1 for a historic use map.

Table 1: WATER RIGHTS PROPOSED FOR CHANGE

W.R. NO.	FLOW RATE (CFS)	VOLUME	PURPOSE	PERIOD OF USE	PLACE OF USE	POINT(S) OF DIVERSION	PRIORITY DATE
41H 110336 00	0.84	Historical/ Beneficial Use	Irrigation	05/01- 10/31	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	06/30/1868
41H 110337 00	4.92	Historical/ Beneficial Use	Irrigation	05/01- 10/31	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	06/01/1868
41H 110338 00	2.68	Historical/ Beneficial Use	Irrigation	05/01- 10/31	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	06/01/1868
41H 110339 00	2.08	Historical/ Beneficial Use	Irrigation	05/01- 10/31	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	06/01/1866
41H 110340 00	1.25	Historical/ Beneficial Use	Irrigation	05/01- 10/31	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	12/01/1876

¹ The place of use for 41H 110340 00 has an error in its legal land description: 80 acres listed in S2NE rather than S2NW.

41H 132779 00	5.00	Historical/ Beneficial Use	Irrigation	05/01 – 11/01	Sec 3&4 T1S, R5E	NWSWSE, Sec 10 T1S, R5E	06/01/1868
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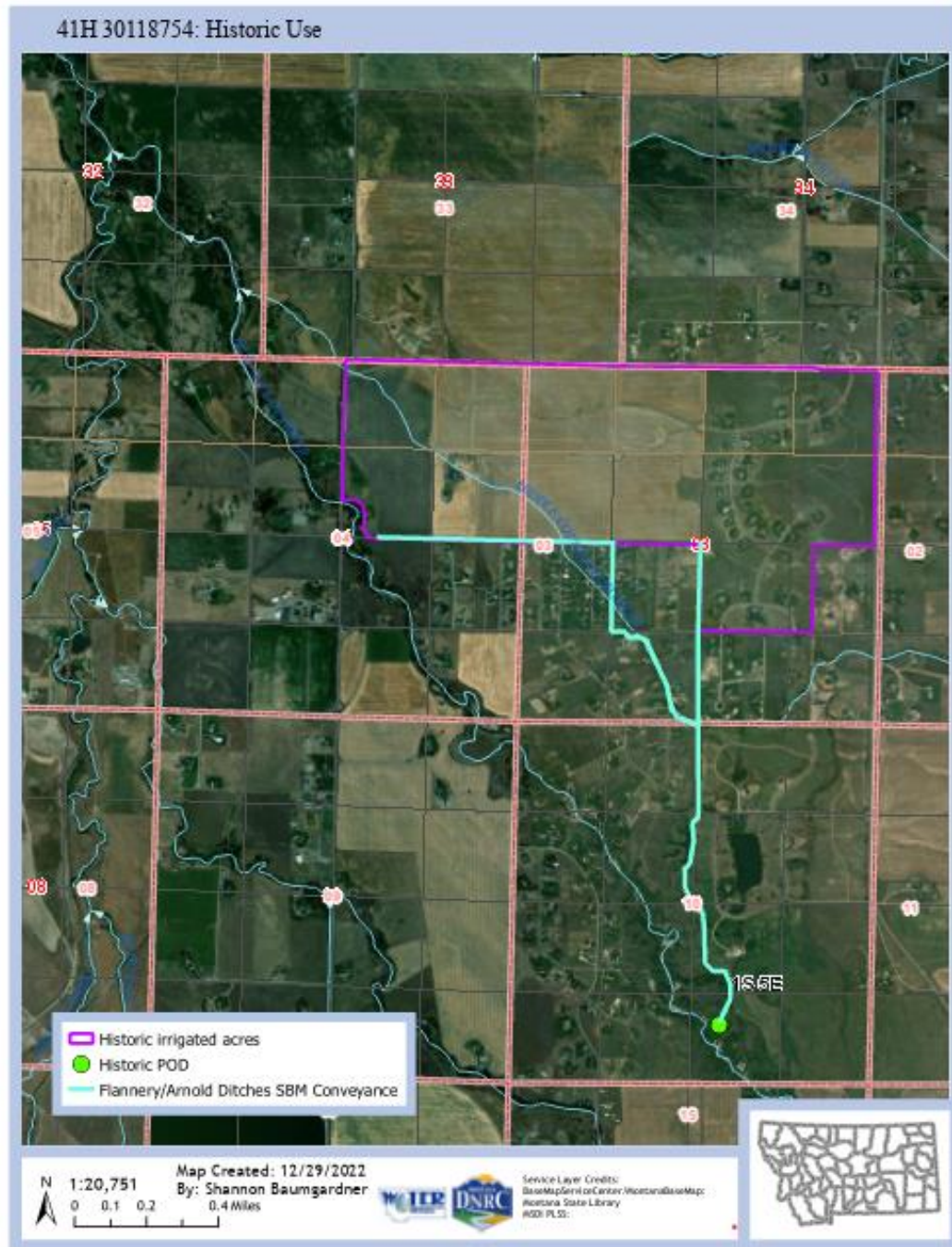


Figure 1. Historic Use Map (Spain Bridge Meadows "SBM")

2. The Applicant sold acres in the eastern half of the claimed place of use, which were turned into a subdivision. The water rights were not severed from the 78 acres of residential lots in the subdivision. These 78 acres may not be changed by the Applicant to conserve water for instream flows. The parcels owned by Spain Bridge Meadows LLC and Spain Bridge Meadows Homeowner's Association have clear water right ownership and can be changed by the Applicant, including retiring them for instream flows. Six quarter-quarter sections of 40 acres each (totaling 240 acres) in the proposed irrigation place of use are under different ownership than Applicant. The owners of these six parcels provided Letters of Written consent for the purposes of possessory interest for this change application. All owners in the irrigation place of use will use the proposed pumps and will have the same irrigation operations as the Applicant.

3. Water Right No. 41H 132779 00 was claimed as a decreed seepage right but was filed incorrectly. Earle Wallingford Jr stated in a 1984 affidavit that he incorrectly filed this right as a decreed water right. The Department notes in the file it should have been filed as a use right. Seepage is not a beneficial use. If additional water was needed for irrigation purposes, then the water right should have been claimed for irrigation purposes instead of seepage. Water right 41H 132779 00 has gone through the preliminary decree process as an irrigation claim. Therefore, the Department will continue to treat this water right as an irrigation right for all calculations.

4. No other water rights are supplemental to or are commingled with the water rights being changed.

5. No previous change authorizations are on the water rights to be changed.

CHANGE PROPOSAL

FINDINGS OF FACT

6. Applicant proposes a permanent change to add a point of diversion, a pump system that includes two pumps on the East Gallatin River, at SWSWNE Section 4, T1S, R5E, Gallatin County (Figure 2). Applicant proposes to retire 132.68 acres mostly in the E2 Section 3, T1S, R5E, Gallatin County, for a partial temporary change in purpose to instream flows for the benefit of the fishery resource and a temporary change in place of use to add a Protected Reach. The proposed Protected Reach runs along the East Gallatin River from the historic point of diversion at NWSWSE Section 10, T1S R5E to the confluence with Hyalite Creek at SWSWNE Section 32,

T1 North, R5E, Gallatin County. The remaining 384 acres will remain irrigated and will use the proposed pump site on the East Gallatin River. The historic point of diversion and conveyance ditch will be an emergency backup for irrigation. The 132.68 retired acres are the Spain Bridge Meadows HOA and Spain Bridge Meadows LLC properties in the eastern half of the historic place of use and roads installed in the remaining irrigated acres. The historic point of diversion and conveyance ditches will remain on the water rights but will not be used except in case of emergency. The unchanged subdivision acres will remain with listed as places of use for the irrigation purpose, but individual wells serve domestic and lawn and garden needs of the subdivision.

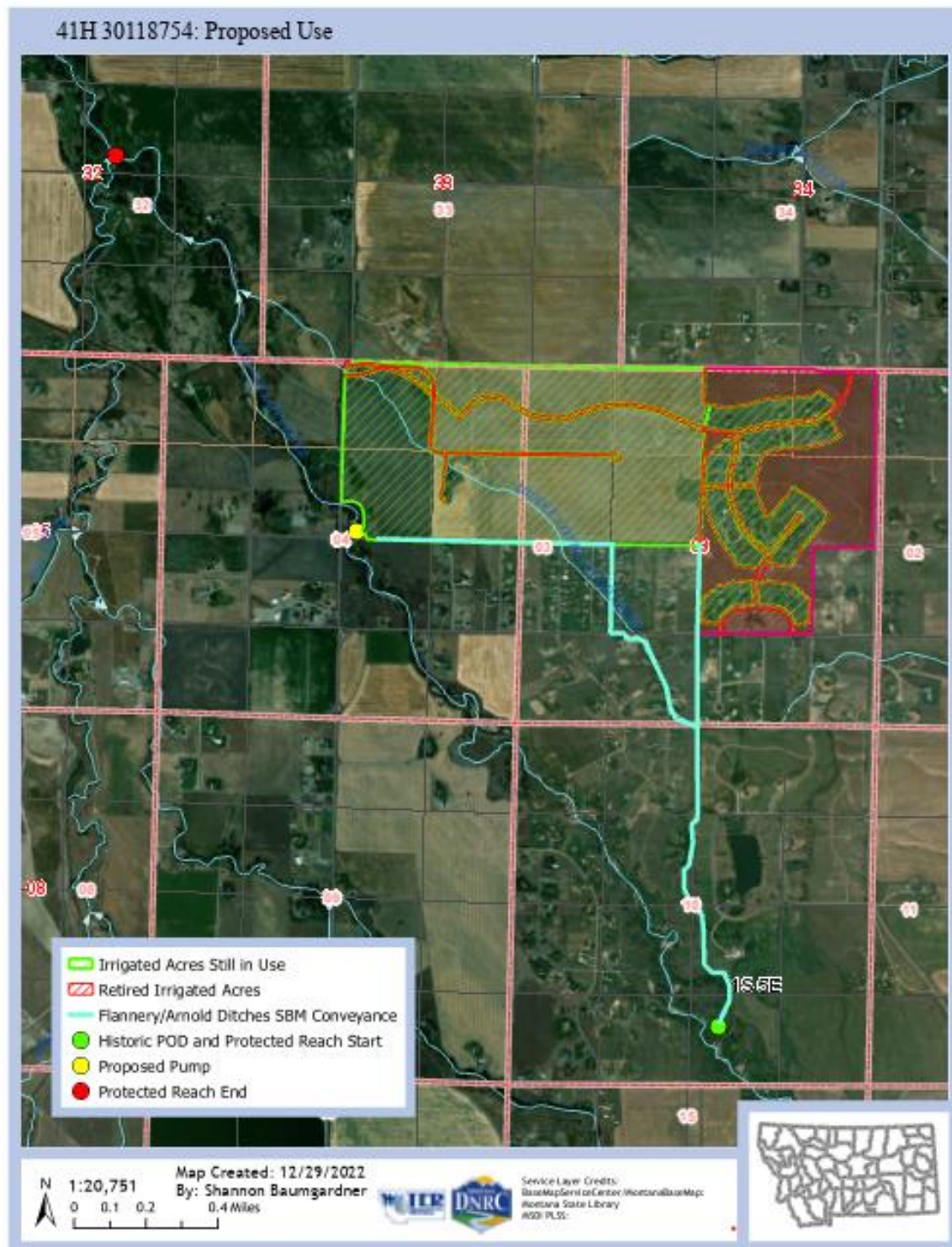


Figure 2. Proposed Use Map

7. The partial change in purpose to instream flows is temporary, for a period of ten years with an option to renew. The Applicant signed a Water Rights Lease Agreement with Trout Unlimited for the duration of the temporary change. No permanent change in purpose is proposed. The pattern of use for irrigation will remain the same for the acreage remaining unchanged.

8. Applicant proposed to protect 11.7 CFS and 610.9 AF from 5/1-10/31 for the temporary instream flow purpose. Applicant can protect the historic diverted volume at the historic point of diversion and through the point where historic return flows began to accrete to the East Gallatin River. According to the Return Flow Report (Water Management Bureau, Attila Fohnagy, 5/12/2022), historic return flows began to accrete just downstream of the historic point of diversion in Section 10, T1S, R5E. The historic diverted volume is protectable at the historic point of diversion. Downstream of the historic point of diversion, along the Protected Reach, the historic consumed from the source volume can be protected instream. The volume for instream uses proposed by the Applicant for the Protected Reach starting below the historic point of diversion exceed the volumes historically consumed from the source found by the Department. The Department modified the proposed instream flow volume to limit the volume of the instream flows to those historically consumed from the source found by the Department and recorded these new volumes in the Technical Report. Applicant did not request a meeting to dispute the findings of the Technical Report within 15 days, so the application is considered amended to reflect these changes. Applicant modified the proposed plan of operation to reduce the instream fishery flow rates to ensure the protectable volume is not reached before the end of the period of use. The final instream flow operation plan for below the historic point of diversion that is proposed for authorization protects 2.04 CFS for 61 days in the period of use, totaling 246.62 AF, along the Protected Reach when the historic point of diversion is not in use and 1.62 CFS for 61 days in the period of use, totaling 196.63 AF, when the historic point of diversion is in use. The historic diverted volume that can be protected to the point where historic return flow accrued to the source, which is located just below the historic point of diversion, is 11.77 CFS and 666.94 AF across the period of use when the historic point of diversion is not in use and 11.77 CFS and 251.39 AF volume across the period of use when the historic point of diversion is in use.

9. Applicant proposed a measurement plan in their Application and Deficiency Letter Response, which includes a measurement site at proposed point of diversion and, in case of enforcement action, at historic point of diversion. Applicant states in Water Rights Lease Agreement for Instream Flow that "Trout Unlimited shall implement whatever stream flow

measurement devices and program that DNRC requires in approving the application for change” (p. 4). The Department requires measurement at the start and end of a protected reach for an instream flow purpose. Applicant shall measure streamflow at the start and end of the Protected Reach.

10. The following conditions will be incorporated into the analysis below

WATER MEASUREMENT RECORDS REQUIRED

The Applicant or a designee shall measure the Protected Reach according to the measurement plan authorized in the Preliminary Determination Order using Department-approved measuring devices. Measurement records shall be made available to the Department upon request. The appropriator shall maintain the measuring devices, so they always operate properly and measure flow rate accurately.

Two measurement locations shall be selected that have suitable conditions and are as close as possible to the following points coinciding with the start and end of the Protected Reach: NWSWSE Section 10, T1S R5E and SWSWNE Section 32, T1 North, R5E, Gallatin County. Applicant shall take a minimum of two measurements annually during the period of use, focusing on low flow conditions between July 15 and October 15.

INSTREAM FISHERY OPERATION PLAN REQUIRED

The Applicant shall implement an operation plan to ensure the following maximum protected instream fishery flow rates and volumes are not exceeded along the Protected Reach (Table 2 and Table 3):

Table 2. Operation Plan, Protected Reach, Ditch Not in Use, by Month (top) and by Water Right (bottom)

Scenario 1.2 (DNRC): Flannery Ditch not in use: 246.62 AF (HCV) Protectable				
[CFS]	CFS to AF/day	AF/day	Days	AF/Year
2.04	1.98	4.04	61	246.4
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	2.04	60.6	
August	31	2.04	125.2	
September	15	2.04	60.6	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			246.4	

	Historic Flow Rate (CFS)	Proportion	ISF Flow Rate (CFS)	ISF Volume (AF)
41H 110336 00	0.84	0.05	0.10	12.3
41H 110337 00	4.92	0.29	0.60	72.3
41H 110338 00	2.68	0.16	0.33	39.4
41H 110339 00	2.08	0.12	0.25	30.6
41H 110340 00	1.25	0.07	0.15	18.4
41H 132779 00	5.00	0.30	0.61	73.5
	16.77		2.04	246.4

Table 3. Operation Plan, Protected Reach, Ditch in Use, by Month (top) and by Water Right (bottom)

Scenario 2 (DNRC): Flannery Ditch in use: 196.63 AF (HCV) Protectable				
(CFS)	CFS to AF/day	AF/day	Days	AF/Year
1.62	1.98	3.21	61	195.7
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	1.62	48.1	
August	31	1.62	99.4	
September	15	1.62	48.1	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			195.7	

	Historic Flow Rate (CFS)	Proportion	ISF Flow Rate (CFS)	ISF Volume (AF)
41H 110336 00	0.84	0.05	0.08	9.8
41H 110337 00	4.92	0.29	0.48	57.4
41H 110338 00	2.68	0.16	0.26	31.3
41H 110339 00	2.08	0.12	0.20	24.3
41H 110340 00	1.25	0.07	0.12	14.6
41H 132779 00	5.00	0.30	0.48	58.3
	16.77		1.62	195.7

POINT OF DIVERSION OPERATION TO PREVENT EXPANSION

Point of diversion at headgate and point of diversion at pumps shall not be used at the same time.

CHANGE CRITERIA

11. The Department is authorized to approve a change if the applicant meets its burden to prove the applicable § 85-2-402, MCA, criteria by a preponderance of the evidence. Matter of Royston, 249 Mont. 425, 429, 816 P.2d 1054, 1057 (1991); Hohenlohe v. DNRC, 2010 MT 203,

¶¶ 33, 35, and 75, 357 Mont. 438, 240 P.3d 628 (an applicant's burden to prove change criteria by a preponderance of evidence is "more probably than not."); Town of Manhattan v. DNRC, 2012 MT 81, ¶¶ 8, 364 Mont. 450, 276 P.3d 920. Under this Preliminary Determination, the relevant change criteria in §85-2-402(2), MCA, are:

(2) Except as provided in subsections (4) through (6), (15), (16), and (18) and, if applicable, subject to subsection (17), the department shall approve a change in appropriation right if the appropriator proves by a preponderance of evidence that the following criteria are met:

(a) The proposed change in appropriation right will not adversely affect the use of the existing water rights of other persons or other perfected or planned uses or developments for which a permit or certificate has been issued or for which a state water reservation has been issued under part 3.

(b) The proposed means of diversion, construction, and operation of the appropriation works are adequate, except for: (i) a change in appropriation right for instream flow pursuant to 85-2-320 or 85-2-436; (ii) a temporary change in appropriation right for instream flow pursuant to 85-2-408; or (iii) a change in appropriation right pursuant to 85-2-420 for mitigation or marketing for mitigation.

(c) The proposed use of water is a beneficial use.

(d) The applicant has a possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use or, if the proposed change involves a point of diversion, conveyance, or place of use on national forest system lands, the applicant has any written special use authorization required by federal law to occupy, use, or traverse national forest system lands for the purpose of diversion, impoundment, storage, transportation, withdrawal, use, or distribution of water. This subsection (2)(d) does not apply to: (i) a change in appropriation right for instream flow pursuant to 85-2-320 or 85-2-436; (ii) a temporary change in appropriation right for instream flow pursuant to 85-2-408; or (iii) a change in appropriation right pursuant to 85-2-420 for mitigation or marketing for mitigation.

12. The evaluation of a proposed change in appropriation does not adjudicate the underlying right(s). The Department's change process only addresses the water right holder's ability to make a different use of that existing right. E.g., Hohenlohe, at ¶¶ 29-31; Town of Manhattan, at ¶8; *In the Matter of Application to Change Appropriation Water Right No.41F-31227 by T-L Irrigation Company* (DNRC Final Order 1991).

13. A temporary change in use of a water right is subject to additional conditions pursuant to § 85-2-407, and 408 MCA, which provides:

Temporary changes in appropriation right. (1) Except as provided in 85-2-410, an

appropriator may not make a temporary change in appropriation right for the appropriator's use or another's use except with department approval in accordance with 85-2-402 and this section.

(2) Except as provided in subsection (9), a temporary change in appropriation right may be approved for a period not to exceed 10 years. A temporary change in appropriation right may be approved for consecutive or intermittent use.

(4) (a) During the term of the original temporary change authorization, the department may modify or revoke its authorization for a temporary change if it determines that the right of an appropriator, other than an appropriator described in subsection (7), is adversely affected.

(b) An appropriator, other than an appropriator identified in subsection (7), may object: (i) during the initial temporary change application process; (ii) during the temporary change renewal process; and (iii) once during the term of the temporary change permit.

(5) The priority of appropriation for a temporary change in appropriation right is the same as the priority of appropriation of the right that is temporarily changed.

(6) Neither a change in appropriation right nor any other authorization right is required for reversion of the appropriation right to the permanent purpose, place of use, point of diversion, or place of storage after the period for which a temporary change was authorized expires.

(8) If a water right for which a temporary change in appropriation right has been approved is transferred as an appurtenance of real property, the temporary change remains in effect unless another change in appropriation right is authorized by the department.

14. An application for a temporary change in use of a water right to maintain or enhance instream flow to benefit the fishery resource is subject to additional conditions pursuant to § 85-2-408. Section 85-2-408, MCA provides in part:

(1) The department shall accept and process an application for a temporary change in appropriation rights to maintain or enhance instream flow to benefit the

fishery resource under the provisions of **85-2-402**, **85-2-407**, and this section.

The application must:

(a) include specific information on the length and location of the stream reach in which the streamflow is to be maintained or enhanced; and

(b) provide a detailed streamflow measuring plan that describes the point where and the manner in which the streamflow must be measured.

(2) (a) A temporary change authorization under the provisions of this section is allowable only if the owner of the water right voluntarily agrees to:

(i) change the purpose of a consumptive use water right to instream flow for the benefit of the fishery resource; or

(ii) lease a consumptive use water right to another person for instream flow to benefit the fishery resource.

(3) In addition to the requirements of **85-2-402** and **85-2-407**, an applicant for a change authorization under this section shall prove by a preponderance of evidence that:

(a) the temporary change authorization for water to maintain and enhance instream flow to benefit the fishery resource, as measured at a specific point, will not adversely affect the water rights of other persons; and

(b) the amount of water for the proposed use is needed to maintain or enhance instream flows to benefit the fishery resource.

...

(5) The department shall approve the method of measurement of the water to maintain and enhance instream flow to benefit the fishery resource through a temporary change authorization as provided in this section.

....

(8) The maximum quantity of water that may be changed to maintain and enhance streamflows to benefit the fishery resource is the amount historically diverted. However, only the amount historically consumed by purpose or consumed from the source, or a smaller amount if specified by the department in the lease authorization, may be used to maintain or enhance streamflows to benefit the fishery resource below the existing point of diversion.

HISTORIC USE AND ADVERSE EFFECT

FINDINGS OF FACT - Historic Use

15. The six water rights being changed are entirely supplemental in the historic place of use. No other supplemental rights are combined with the water rights to be changed.

16. No issues of nonuse exist.

17. Water Right Claim No. 41H 110339 00 has a priority date of 06/01/1866. Water Right Claim Nos. 41H 11337 00, 41H 110338 00, and 41H 132779 00 have a priority date of 06/01/1868. Water Right Claim No. 41H 110336 00 has a priority date of 06/30/1868. Water Right Claim No.

41H 110340 00 has a priority date of 12/01/1876. The use rights perfected by Graham, Campbell, Toohey, and Flannery provide basis for five of the six changed rights. These rights were contested in *Toohey v. Graham and Campbell*, 24 Mont. 13 (1900). The Supreme Court remanded the case back to the District Court in 1900 after finding not all water rights were perfected until 1876. The Water Court adjudicated the decree these water right claims were based on. All six changed water rights are part of the Temporary Preliminary Decree for Gallatin River, issued on 09/26/1985 and Preliminary Decree for Gallatin River, issued on 10/11/2018.

Historic Acres and Flow Rate

18. The Department found the maximum historic acres for each of the six water rights to be 516.7 acres, compared to the 520.93 claimed acres. Applicant accepted these findings by not requesting a meeting to dispute results of Technical Report within 15 days. The 1961 Gallatin County Water Resources Survey indicates 24.2 acres are irrigated by private ditches and another 385.9 acres have “potential [for irrigation] under existing facilities”. The Department identified 516 acres irrigated with aerial photograph 10950, dated 5/6/1947. The Department identified 516.7 acres irrigated with aerial photograph 1-36, dated 9/5/1976.

19. The Department found the historic flow rate to be 16.77 CFS, which is the combined flow rate of the six changed water rights. The Flannery Ditch Capacity Report (Restoration Engineering, Application, Exhibit G) illustrates the ditch has the capacity to convey between 148.34 CFS and 274.70 CFS at the headgate, which is greater than all water rights conveyed by the ditch (Table 4).

Table 4. Water Rights of Conveyance Ditch

Water Right	Flow (CFS)
41H 110336 00	0.84
41H 110337 00	4.92
41H 110338 00	2.68
41H 110339 00	2.08
41H 110340 00	1.25
41H 132779 00	5
41H 126736 00	0.13
41H 140909 00	1.03
41H 140910 00	1.2
41H 140912 00	1.75
41H 140913 00	1.48
41H 72309 00	5

The lowest capacity found for the ditch is between 17.17 CFS and 31.79 CFS at Cross Section C. The lower end of the estimated capacity at Cross Section C, 17.17 CFS, is less than the sum of the water rights conveyed by the ditch, 27.36 CFS. However, Cross Section C is located after the place of use for four of the water rights and the remaining water rights can be conveyed by two ditches that are formed by a split in the Conveyance Ditch located between Cross Section B and Cross Section C. The Department finds the Conveyance Ditch has the capacity to convey all water rights involved in this change application.

Historic Consumptive Volume

20. Applicant elected to use the Department's standard historic consumptive use methodology in ARM 36.12.1902.

21. The six water rights being changed are Statements of Claim and as such, the underlying historic use of the rights will be evaluated as they existed prior to July 1, 1973. According to an affidavit by Steve Wallingford, no history of calls on these water rights exists. Given this general reliability of the water rights, historic consumptive use will be calculated for the full irrigation season described by the Applicant. The Applicant states that historical sprinkler irrigation practices typically lasted for 110 days, from May 7 through June 30, July 1 through July 14, and July 15 to September 10. The fields are harvested during each of these three irrigation windows. The Department will use 110 days as the number of days irrigated.

22. The Department used the following formula to assign Historic Consumptive Volume to each water right based on the proportion of the total flow rate the water right represents:

$$\text{Historic Consumptive Volume Including IL, Per water right} = \text{Historic Consumptive Volume Including IL, Total} \times (\text{water right flow rate} / \text{total flow rate of six supplemental rights proposed for change})$$

23. The crops historically irrigated were primarily wheat and barley, but also include alfalfa and grass hay. The Applicant described the historical conveyance system as sprinkler irrigation, installed in Spring 1973. The Department concludes the irrigation type as of July-1973 was wheel line sprinkler irrigation. The Applicant and Department used the Bozeman Montana State University weather station, which has a seasonal evapotranspiration of 18.42 inches for flood/sprinkler irrigation. The 1964-1973 Management Factor for Gallatin County is 73.5%. The Department selected an on-farm efficiency of 70% and irrecoverable losses of 10% because the irrigation method is sprinkler. See Table 5 for an overview of the calculations.

Table 5. Historic Consumptive Volume

Historic Consumptive Volume (HCV) Flood Sprinkler	Bozeman MT State Flood/Sprinkler ET (Inches)	Gallatin County 1964-1973 Management Factor (Percent)	Historic Acres	HCV AF (minus IL)	On-farm Efficiency	Field Application AF	Historic Irrecoverable Losses (IL) Sprinkler 10%:	HCV AF (Including IL)
Total	18.42	73.5%	516.7	582.93	70%	832.76	83.28	666.21

Water Right	Flow Rate	Flow Rate Proportion	HCV (minus IL) by water right	HCV (inc. IL) by water right	Total Flow Rate
41H 110336 00	0.84	0.05	29.20	33.37	16.77
41H 110337 00	4.92	0.29	171.02	195.45	16.77
41H 110338 00	2.68	0.16	93.16	106.47	16.77
41H 110339 00	2.08	0.12	72.30	82.63	16.77
41H 110340 00	1.25	0.07	43.45	49.66	16.77
41H 132779 00	5.00	0.30	173.80	198.63	16.77

Historic Diverted Volume: Overview

24. The Department calculated historic diverted volume pursuant to ARM 36.12.1902(10) and the Department's standard methodology (Roberts and Heffner, 2012), using the following general equation: Total historic diverted volume = water applied to the field + distributed conveyance losses. The Department calculated historic diverted volume using the Applicant's explanation of irrigation operations and the best available information regarding the ditch.

25. The Department distributed conveyance losses based on the Department's memorandum 'Distributing Conveyance Loss on Multiple User Ditches' (Heffner, 2020). The Spain Bridge Meadows water rights are conveyed by both the Flannery and Arnold ditches. For the sake of diverted volume calculations, only the segments of each ditch that convey Spain Bridge Meadows water rights will be included. This stretch of ditches will be known as the "Conveyance Ditch". The Department divided the Conveyance Ditch into Ditch Water Right Combinations based on the water rights that are conveyed in that ditch segment. The Department determined the water rights conveyed in each segment of the Conveyance Ditch by querying all water rights conveyed by Arnold and Flannery ditches, looking at the claim files to see where these water rights use the Conveyance ditch, mapping the places of use based on the claim files, and assuming conveyance loss runs between the location the water right joins the Conveyance Ditch and start of the place of use. See Table 6 for a list of every water right assigned to a Ditch Water Right Combination and Figure 3 for a map of where the Ditch Water Right Combinations and places of use are located. Water rights 41H 141870 00 and 41H 141871 00 were not included in the conveyance loss calculations because the Conveyance Ditch originates in their place of use and conveyance losses are not calculated for a water right in its place of use. Child rights that were split from 41H 141870 00 and 41H 141871 00 in 2022, 41H 30154288 and 41H 30154289, were not included in the historical use analysis because the flow rate was not split. Provisional Permit 41H 72309 00 was not included in the historical use analysis because it did not exist as of 1973.

Table 6. Historic Ditch Water Right Combinations

Down-ditch Combo	Water Right	Flow	Total Flow	Distribution Proportion
1	41H 110336 00	0.84	22.36	0.038
	41H 110337 00	4.92		0.220
	41H 110338 00	2.68		0.120
	41H 110339 00	2.08		0.093
	41H 110340 00	1.25		0.056
	41H 132779 00	5		0.224
	41H 126736 00	0.13		0.006
	41H 140909 00	1.03		0.046
	41H 140910 00	1.2		0.054
	41H 140912 00	1.75		0.078
	41H 140913 00	1.48		0.066
2	41H 110336 00	0.84	22.23	0.038
	41H 110337 00	4.92		0.221
	41H 110338 00	2.68		0.121
	41H 110339 00	2.08		0.094
	41H 110340 00	1.25		0.056
	41H 132779 00	5		0.225
	41H 140909 00	1.03		0.046
	41H 140910 00	1.2		0.054
	41H 140912 00	1.75		0.079
	41H 140913 00	1.48		0.067
3	41H 110336 00	0.84	16.77	0.050
	41H 110337 00	4.92		0.293
	41H 110338 00	2.68		0.160
	41H 110339 00	2.08		0.124
	41H 110340 00	1.25		0.075
	41H 132779 00	5		0.298

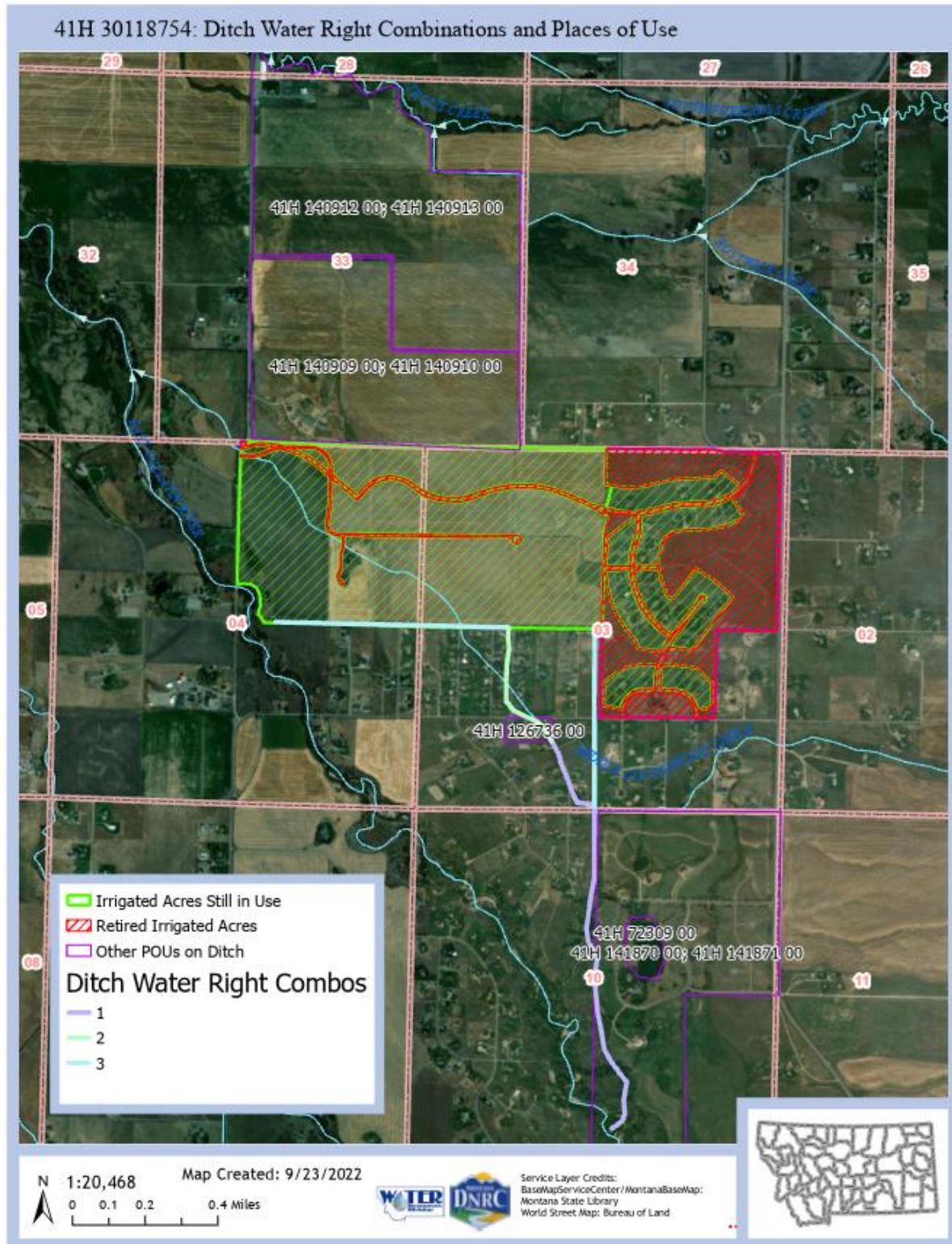


Figure 3. Historic Ditch Water Right Combinations and Places of Use

26. The following tables summarize the historic diverted volume calculation. The first table (Table 7) overviews the total diverted volume for each Ditch Water Right Combination. This table is the total for all water rights in a ditch segment, both Spain Bridge Meadows and other ditch users. The second table (Table 8) shows the distributed diverted volume, which includes only the portion of the conveyance loss attributable to each of the Spain Bridge Meadows water rights. To distribute the conveyance losses, the flow rates for all water rights on each Ditch Water Right Combination were summed. The distribution proportion = flow rate of the Spain Bridge Meadow water right / total flow rate of all water rights in the Ditch Water Right Combination. For a summary of the distribution proportions, see Table 6. Tables 9 and 10 provide a detailed breakdown of the distributed conveyance losses.

27. The Department calculated conveyance losses for each Ditch Water Right Combination on the Conveyance Ditch based on measurements provided by the Applicant in the “Flannery Ditch Capacity Report”, measurements taken by Department in ArcGIS Pro based on the 1961 Gallatin County Water Resource Survey, and the Web Soil Survey. The Department used ArcGIS Pro 2.7.1 to measure the length of the ditches, as identified in the Water Resources Survey, between the historic point of diversion and the historic place of use. The Department calculated the conveyance losses for the four cross sections included with the Flannery Ditch Capacity Report (Figure 4), which are located along the Conveyance Ditch. The Department assigned the cross-sections to one of the Ditch Water Right Combinations. For historical use, the Department used ditch dimensions from the Ditch Capacity Report. Site A and Site B dimensions are used to calculate conveyance losses for Ditch Water Rights Combination 1, Site C for combo 2 and Site D for combo 3.

Table 7. Total Historic Diverted Volume

Historic Diverted Volume (HDV)	HCV AF (minus IL)	On-farm Efficiency	Seasonal Conveyance Loss Volume (seepage loss + vegetation loss + ditch evaporation)	Total HDV AF	
	582.9	70%	533.8	1366.6	
Seepage Loss:	Ditch Wetted Perimeter (Feet)	Ditch Length (Feet)	Ditch Loss Rate (ft3/ft2/day)	Days Irrigated	Seepage Loss (/43560)
Combo 1	10.99	6175	1.4	110	239.9
Combo 2	3.74	1979	1.4	110	26.2
Combo 3	9.60	5989	1.4	110	203.3
Combo 4	0	0	0	0	0.0
Vegetation Loss:	% loss/mile	Est. Flow Rate (CFS) =	Days Irrigated	ditch length (miles)	Vegetation Loss (*2)
Combo 1	0.0075	22.36	110	1.2	43.1
Combo 2	0.0075	20.93	110	0.4	12.9
Combo 3	0.0075	3.3	110	1.1	6.2
Combo 4	0	0	0	0.0	0.0
Ditch Evaporation:	Ditch Width (Feet)	Ditch Length (Feet)	Annual Evaporation (Potts)	Period Adjusted Evaporation	Ditch Evaporation (/43560)
Combo 1	5.75	6175	3.15	1.65	1.3
Combo 2	1.5	1979	3.15	1.65	0.1
Combo 3	3.2	5989	3.15	1.65	0.7
Combo 4	0	0	0	0.00	0.0

Table 8. Distributed Historic Diverted Volume

	HCV (minus IL) by water right	Distributed Conveyance Loss	Distributed HDV AF
41H 110336 00	29.20	22.69	64.41
41H 110337 00	171.02	132.92	377.24
41H 110338 00	93.16	72.40	205.49
41H 110339 00	72.30	56.19	159.48
41H 110340 00	43.45	33.77	95.84
41H 132779 00	173.80	135.08	383.37
TOTAL	582.93	453.06	1285.82

Table 9. Detailed Breakdown of Distributed Historic Conveyance Losses (all units in AF, except for unitless "Distribution Proportion")

	<u>Seepage Loss</u>	<u>Distributed Seepage Loss</u>	<u>Vegetation Loss</u>	<u>Distributed Vegetation Loss</u>	<u>Ditch Evaporation</u>	<u>Distributed Ditch Evaporation</u>	<u>Distribution Proportion</u>
Combo 1	239.92		43.15		1.34		
41H 110336 00	239.92	9.01	43.15	1.62	1.34	0.05	0.038
41H 110337 00	239.92	52.79	43.15	9.49	1.34	0.30	0.220
41H 110338 00	239.92	28.76	43.15	5.17	1.34	0.16	0.120
41H 110339 00	239.92	22.32	43.15	4.01	1.34	0.13	0.093
41H 110340 00	239.92	13.41	43.15	2.41	1.34	0.08	0.056
41H 132779 00	239.92	53.65	43.15	9.65	1.34	0.30	0.224
Combo 2	26.17		12.94		0.11		
41H 110336 00	26.17	0.99	12.94	0.49	0.11	0.00	0.038
41H 110337 00	26.17	5.79	12.94	2.86	0.11	0.02	0.221
41H 110338 00	26.17	3.15	12.94	1.56	0.11	0.01	0.121
41H 110339 00	26.17	2.45	12.94	1.21	0.11	0.01	0.094
41H 110340 00	26.17	1.47	12.94	0.73	0.11	0.01	0.056
41H 132779 00	26.17	5.89	12.94	2.91	0.11	0.03	0.225
Combo 3	203.26		6.18		0.73		
41H 110336 00	203.26	10.18	6.18	0.31	0.73	0.04	0.050
41H 110337 00	203.26	59.63	6.18	1.81	0.73	0.21	0.293
41H 110338 00	203.26	32.48	6.18	0.99	0.73	0.12	0.160
41H 110339 00	203.26	25.21	6.18	0.77	0.73	0.09	0.124
41H 110340 00	203.26	15.15	6.18	0.46	0.73	0.05	0.075
41H 132779 00	203.26	60.60	6.18	1.84	0.73	0.22	0.298
Combo 4	0.00	0.00	0.00	0.00	0.00	0.00	0

Table 10. Summary of Distributed Historic Conveyance Losses (all units in AF)

	<u>Distributed Seepage Loss</u>	<u>Distributed Vegetation Loss</u>	<u>Distributed Ditch Evaporation</u>	<u>Distributed Conveyance Loss</u>
41H 110336 00	20.18	2.42	0.09	22.69
41H 110337 00	118.22	14.17	0.53	132.92
41H 110338 00	64.39	7.72	0.29	72.40
41H 110339 00	49.98	5.99	0.23	56.19
41H 110340 00	30.03	3.60	0.14	33.77
41H 132779 00	120.14	14.40	0.54	135.08

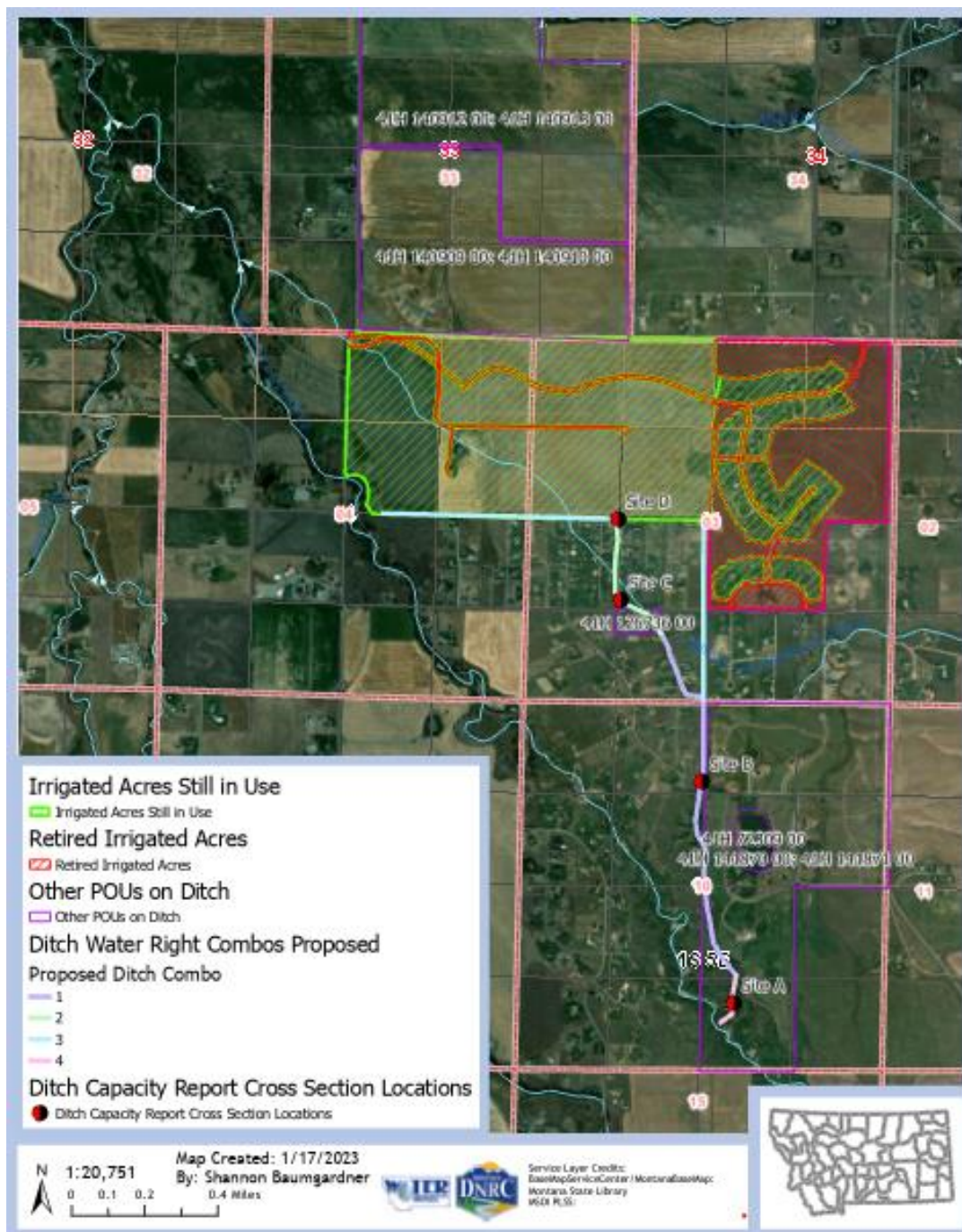


Figure 4. Ditch Capacity Report Cross Section Locations

Historic Diverted Volume: Seepage

29. The Department calculated seepage loss with the following equation: Distributed seepage loss = (wetted perimeter x ditch length x ditch loss rate x days irrigated) x flow rate

proportion x distribution proportion. The Department calculated the wetted perimeter, for each Ditch Water Right Combination using Manning's Equation based on the following assumptions: 1) bottom channel widths derived from the cross sections included with the Flannery Ditch Capacity Report, 2) slope derived from the longitudinal profiles included in the Flannery Ditch Capacity Report, 3) flow depth derived from the cross sections included with the Flannery Ditch Capacity Report, and 4) channel roughness equal to the high roughness estimate (0.50) provided in the Flannery Ditch Capacity Report. The ditch loss rate is 1.4 ft³/ft²/day, typical for the soil types underlying the Conveyance Ditch, Turner Loam and Straw Loam (Soil Conservation Service, Web Soil Survey). The Department determined the days irrigated (110) based on the description of historic practices in the Application. The Department averaged the two wetted perimeters calculated for Ditch Water Right Combination 1 (Site A and Site B). Seepage loss is distributed by multiplying the total seepage loss by the distribution proportion for each water right.

Historic Diverted Volume: Vegetation Loss

30. The Department calculated vegetation loss with the following equation: Distributed vegetation loss = (% loss/mile x flow rate x days irrigated x ditch length) x flow rate proportion x distribution proportion. The Department used the standard rate of 0.75% loss per mile to calculate vegetation loss. For the flow rate, the Department used the lesser of two values: either the estimate of Flow at Water Line for High Roughness found in the Flannery Ditch Capacity Report or total of water rights conveyed in that ditch segment. Days irrigated, 110, comes from the Application. The Department used ArcGIS Pro to measure reach lengths. The Department distributed vegetation loss by multiplying the total vegetation loss by the distribution proportion for each water right.

Historic Diverted Volume: Ditch Evaporation

31. The Department calculated ditch evaporation with the following equation: Distributed ditch evaporation = (ditch width x ditch length x evaporation constant adjusted for reduced period of use) x flow rate proportion x distribution proportion. The Department derived ditch width from the cross sections included with the Flannery Ditch Capacity Report. The Department adjusted evaporation for Bozeman weather station, 3.15 AF/year (Potts, 1988), to reflect 110 days per year use, 1.65 AF/year. The Department measured reach lengths with ArcGIS Pro. The Department distributed ditch evaporative loss by multiplying the total evaporative loss by the distribution proportion for each water right.

32. The Department finds the following historic use (Table 11).

Table 11. Historic Use

WR Claim #	Priority Date	Diverted Volume (AF)	Flow Rate (CFS)	Purpose (Total Acres)	Consumptive Use (AF)	Place of Use	Point of Diversion
41H 110336 00	06/30/1868	64.41	0.84	Irrigation (516.7 acres)	33.37	Sec 3&4, Twp 1S, Rge 5E	NWSWSE, Sec 10, Twp 1S, Rge 5E, Gallatin
41H 110337 00	06/01/1868	377.24	4.92	Irrigation (516.7 acres)	195.45	Sec 3&4, Twp 1S, Rge 5E	NWSWSE Sec 10, Twp 1S, Rge 5E, Gallatin
41H 110338 00	06/01/1868	205.49	2.68	Irrigation (516.7 acres)	106.47	Sec 3&4, Twp 1S, Rge 5E	NWSWSE Sec 10, Twp 1S, Rge 5E, Gallatin
41H 1103389 00	06/01/1866	159.48	2.08	Irrigation (516.7 acres)	82.63	Sec 3&4, Twp 1S, Rge 5E	NWSWSE Sec 10, Twp 1S, Rge 5E, Gallatin
41H 110340 00	12/01/1876	95.84	1.25	Irrigation (516.7 acres)	49.66	Sec 3&4, Twp 1S, Rge 5E	NWSWSE Sec 10, Twp 1S, Rge 5E, Gallatin
41H 132779 00	06/01/1868	383.37	5.00	Irrigation (516.7 acres)	198.63	Sec 3&4, Twp 1S, Rge 5E	NWSWSE Sec 10, Twp 1S, Rge 5E, Gallatin

FINDINGS OF FACT – Adverse Effect

33. When Water Right Claim Nos. 41H 110336 00, 41H 110337 00, 41H 110338 00, 41H 110339 00, 41H 110340 00, and 41H 132779 00 undergo the proposed permanent change, an additional point of diversion at a pump system on the East Gallatin River, will be at SWSWNE Section 4, T1S, R5E, Gallatin County. No other permanent changes to the water rights exist. The temporary change on the six water rights will entail retiring 132.68 retired acres, 384 irrigated acres remaining, an additional instream fishery purpose, and an additional place of use for the Protected Reach between NWSWSE Section 10, T1S R5E and SWSWNE Section 32, T1N R5E in the East Gallatin River.

Proposed Flow Rates

34. The proposed uses for the temporary change include irrigation and instream flows. The Applicant provides the proposed irrigation and instream flow rates in Exhibit F3 of the Application (Table 12). The irrigation flow rate proposed by the Applicant, 5 CFS, is the maximum capacity of the pumps at the new point of diversion.

Table 12. Exhibit F3, Application, page 31

Claim No.	Historic	Proposed	
	Flow Rate	Irrigation	Instream Flow
41H 110336 00	0.84 – Irrigation	0.55	0.59
41H 110337 00	4.92 – Irrigation	1.76	3.45
41H 110338 00	2.68 – Irrigation	1.10	1.88
41H 110339 00	2.08 – Irrigation	0.92	1.46
41H 110340 00	1.25 – Irrigation	0.67	0.88
41H 132779 00*	5.00 – Seepage	0.00	3.51
	16.77 cfs	5.0 cfs	11.77 cfs

35. The Department recalculated the protectable volumes to be consistent with MCA §85-2-408, which included four scenarios: A) up to the historic point of diversion and ditch not in use, B) along Protected Reach and ditch not in use, C) up to the historic point of diversion and ditch in use, and D) along Protected Reach and ditch in use. The Department used the flow rates provided by the Applicant (Exhibit F3, Application) for instream flows but calculated the number of days it will take at each flow rate to reach the maximum protectable volumes and included this result in the Technical Report. The Consultant responded to the technical report with an operation plan for the Protected Reach when the ditch is not in use and operation plan for the Protected Reach when the ditch is in use (two scenarios rather than four, which align with Scenario B and Scenario D), which ensure the protected flow rates do not exceed the protectable volumes found by the Department (email chain between Consultant (Meg Casey) and DNRC (Shannon Baumgardner) dated December 30, 2022, Re: SBM – ISF Operation Plan).

36. The following table shows the flow rates for the proposed uses, which are based off the two Operation Plans proposed by the Applicant in the 12/30/2022 email chain (Table 13). The instream flow operation plan for the Protected Reach has a combined instream flow rate of 2.04 CFS when the Conveyance Ditch is not in use and 1.62 CFS when the Conveyance Ditch is in use. The Department modified the irrigation flow rates proposed in Application to reflect 41H 132779 00 as an irrigation right rather than a seepage right. Applicant accepted this change by not requesting a meeting to dispute the Technical Report within 15 days. The proposed irrigation flow rate still sums to 5 CFS, the maximum capacity of the pumps, but the flow rate attributed to

each water right is found by multiplying 5 CFS by the flow rate proportion. This is the same method used by the Applicant to determine irrigation flow rates for each water right but includes all six water rights.

Table 13. Proposed Flow Rates for Temporary Change (Scenario 1 is along Protected Reach and ditch not in use, Scenario 2 is along Protected Reach and ditch in use)

	Historic Flow Rate	Flow Rate Proportion	Irrigation Flow Rate (CFS)	ISF Flow Rate (CFS): Scenario 1	Total Flow Rate (CFS): Scenario 1	ISF Flow Rate (CFS): Scenario 2	Total Flow Rate (CFS): Scenario 2
41H 110336 00	0.84	0.05	0.25	0.10	0.35	0.08	0.33
41H 110337 00	4.92	0.29	1.47	0.60	2.07	0.48	1.94
41H 110338 00	2.68	0.16	0.80	0.33	1.13	0.26	1.06
41H 110339 00	2.08	0.12	0.62	0.25	0.87	0.20	0.82
41H 110340 00	1.25	0.07	0.37	0.15	0.52	0.12	0.49
41H 132779 00	5.00	0.30	1.49	0.61	2.10	0.48	1.97
	16.77		5.00	2.04	7.04	1.62	6.62

Proposed Irrigation Consumptive Volume

37. The Applicant proposes 384 acres of irrigation and 132.68 acres retired from irrigation. All proposed irrigated acres are in the historic place of use; based on the Department’s “Policy memo – change in method of irrigation” (Davis, 2015), the management factor, on-farm efficiency, and irrecoverable losses will remain the same as historic values. Table 14 shows the parameters used to calculate the proposed irrigation consumptive volume. The volume is attributed to each water right based on flow rate proportion, which equals the flow rate of the water right divided by the combined flow rate of all six Spain Bridge Meadows water rights.

Table 14. Proposed Consumptive Volume

Proposed Consumptive Volume (PCV) Flood Sprinkler	Bozeman MT State Flood/Sprinkler ET (Inches)	Gallatin County 1964-1973 Management Factor (Percent)	Proposed Acres	PCV AF (minus IL)	On-farm Efficiency	Field Application AF	Proposed Irrecoverable Losses (IL) Sprinkler 10%:	PCV AF (Including IL)
	18.42	73.5%	384	433.2	70%	618.9	61.9	495.13
Water Right	Flow Rate	Total Flow Rate	Flow Rate Proportion	PCV (minus IL) by water right	PCV (inc. IL) by water right	Proposed Field Applied (AF)		
41H 110336 00	0.84	16.77	0.05	21.70	24.80	31.00		
41H 110337 00	4.92	16.77	0.29	127.10	145.26	181.58		
41H 110338 00	2.68	16.77	0.16	69.24	79.13	98.91		
41H 110339 00	2.08	16.77	0.12	53.73	61.41	76.76		
41H 110340 00	1.25	16.77	0.07	32.29	36.91	46.13		
41H 132779 00	5.00	16.77	0.30	129.17	147.62	184.53		

Proposed Irrigation Diverted Volume

38. The Department calculated the proposed irrigation diverted volume pursuant to ARM

36.12.1902(10) and the Department's standard methodology (Roberts and Heffner, 2012). Proposed Irrigation Diverted Volume was determined using the historic use analysis, best available information regarding the Conveyance Ditch, and information about the proposed additional point of diversion submitted by the Applicant. The Department distributed conveyance losses using the same methods as for Historic Diverted Volume, based on the Department's memorandum 'Distributing Conveyance Loss on Multiple User Ditches' (Heffner, 2020). The Department assigned Ditch Water Right Combinations using the same methods as for historic ditches. See Figure 5 for map of Proposed Ditch Water Right Combinations and Table 15 for list of combination water rights and distribution proportions.

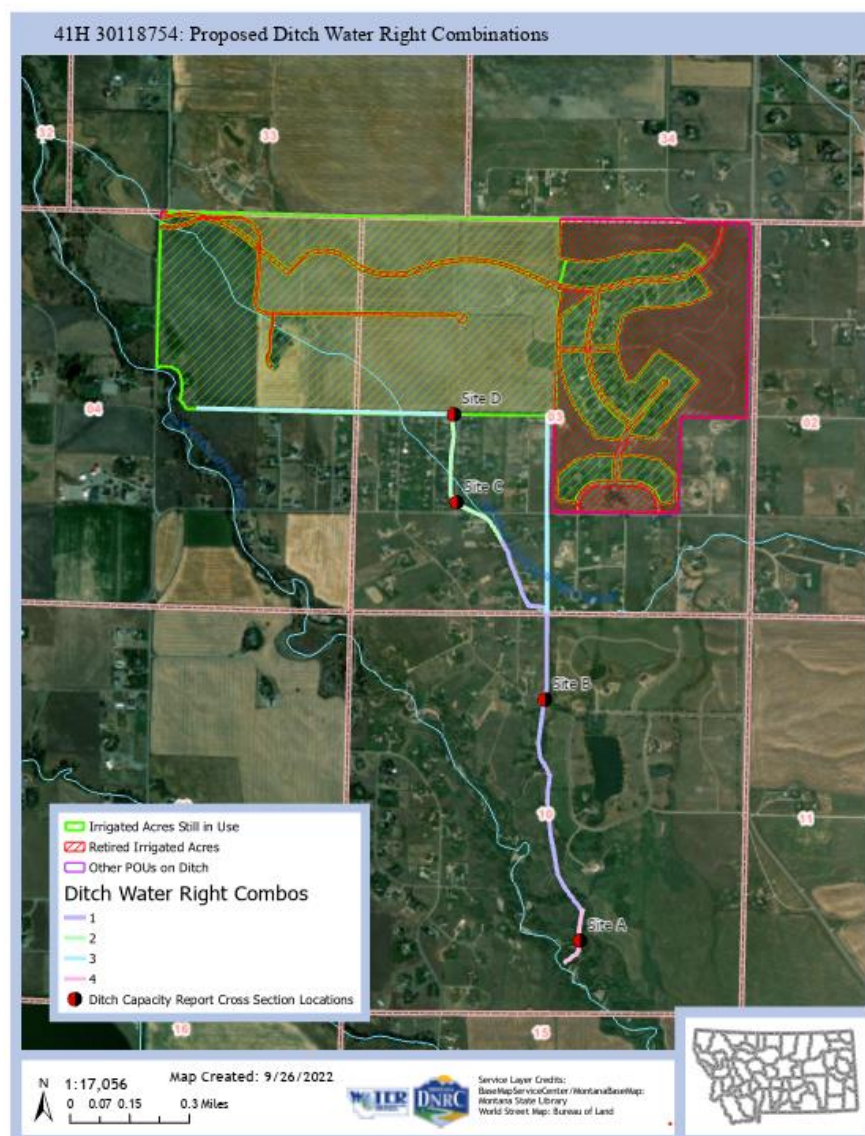


Figure 5. Proposed Ditch Water Right Combinations

Table 15. Proposed Ditch Water Right Combinations. Each color represents one place of use and multiple water rights with same color all serve the same place of use. Flow is in CFS, and Distribution Proportion is unitless.

Ditch Water Right Combination	Water Right	Flow	Total Flow	Distribution Proportion
1	41H 110336 00	0.84	22.36	0.038
	41H 110337 00	4.92		0.220
	41H 110338 00	2.68		0.120
	41H 110339 00	2.08		0.093
	41H 110340 00	1.25		0.056
	41H 132779 00	5		0.224
	41H 126736 00	0.13		0.006
	41H 140909 00	1.03		0.046
	41H 140910 00	1.2		0.054
	41H 140912 00	1.75		0.078
	41H 140913 00	1.48		0.066
2	41H 110336 00	0.84	22.23	0.038
	41H 110337 00	4.92		0.221
	41H 110338 00	2.68		0.121
	41H 110339 00	2.08		0.094
	41H 110340 00	1.25		0.056
	41H 132779 00	5		0.225
	41H 140909 00	1.03		0.046
	41H 140910 00	1.2		0.054
	41H 140912 00	1.75		0.079
	41H 140913 00	1.48		0.067
3	41H 110336 00	0.84	16.77	0.050
	41H 110337 00	4.92		0.293
	41H 110338 00	2.68		0.160
	41H 110339 00	2.08		0.124
	41H 110340 00	1.25		0.075
	41H 132779 00	5		0.298
4	41H 110336 00	0.84	27.36	0.031
	41H 110337 00	4.92		0.180
	41H 110338 00	2.68		0.098
	41H 110339 00	2.08		0.076
	41H 110340 00	1.25		0.046
	41H 132779 00	5		0.183
	41H 126736 00	0.13		0.005
	41H 140909 00	1.03		0.038
	41H 140910 00	1.2		0.044
	41H 140912 00	1.75		0.064
	41H 140913 00	1.48		0.054
	41H 72309 00	5		0.183

39. The Department found two proposed irrigation diverted volumes, one for when the old point of diversion is in use and one for when the new point of diversion is in use. The historic and proposed point of diversion will never be used concurrently. When the new point of diversion is in use, no appreciable conveyance losses occur. The water is pumped directly from East Gallatin River at the property boundary and piped straight to the sprinkler system. When the new point of diversion is in use, the irrigation diverted volume will equal the field applied volume, 618.9 AF.

When the historic point of diversion is in use, the irrigation diverted volume will be the field applied volume + the conveyance losses for 384 acres. The Department calculated the proposed irrigation diverted volume using the same methods as the historic irrigation diverted volume, with the exception that Site A ditch dimensions are used for Combo 4 and Site B dimensions are used for Combo 1 (Table 16). For a detailed breakdown of the diverted volume assigned to each water right, see Table 17 and Table 18.

Table 16. Proposed Diverted Volume for 384 irrigated acres when historic point of diversion and ditch are in use

Proposed Diverted Volume (PDV)	PCV AF (minus IL)	On-farm Efficiency	Seasonal Conveyance Loss Volume (seepage loss + vegetation loss + ditch evaporation)	Total PDV AF	Distributed PDV AF
	433.2	70%	491.8	1110.7	1034.47
<i>Seepage Loss:</i>	Ditch Wetted Perimeter (Feet)	Ditch Length (Feet)	Ditch Loss Rate (ft3/ft2/day)	Days Irrigated	Seepage Loss (/43560)
Combo 1	8.36	5402	1.4	110	159.7
Combo 2	3.74	1979	1.4	110	26.2
Combo 3	9.60	5989	1.4	110	203.3
Combo 4	13.62	773	1.4	110	37.2
<i>Vegetation Loss:</i>	% loss/mile	Est. Flow Rate (CFS) =	Days Irrigated	ditch length (miles)	Vegetation Loss (*2)
Combo 1	0.0075	22.36	110	1.0	37.7
Combo 2	0.0075	20.93	110	0.4	12.9
Combo 3	0.0075	3.3	110	1.1	6.2
Combo 4	0.0075	27.36	110	0.1	6.6
<i>Ditch Evaporation:</i>	Ditch Width (Feet)	Ditch Length (Feet)	Annual Evaporation (Potts)	Period Adjusted Evaporation	Ditch Evaporation (/43560)
Combo 1	5	5402	3.15	1.65	1.0
Combo 2	1.5	1979	3.15	1.65	0.1
Combo 3	3.2	5989	3.15	1.65	0.7
Combo 4	6.5	773	3.15	1.65	0.2

Table 17. Detailed Breakdown of Proposed Conveyance for 384 irrigated acres when historic point of diversion and ditch are in use (all units in AF, except for unitless "Distribution Proportion")

	<u>Seepage Loss</u>	<u>Distributed Seepage Loss</u>	<u>Vegetation Loss</u>	<u>Distributed Vegetation Loss</u>	<u>Ditch Evaporation</u>	<u>Distributed Ditch Evaporation</u>	<u>Distribution Proportion</u>
Combo 1	159.66		37.75		1.02		
41H 110336 00	159.66	6.00	37.75	1.42	1.02	0.04	0.038
41H 110337 00	159.66	35.13	37.75	8.31	1.02	0.23	0.220
41H 110338 00	159.66	19.14	37.75	4.52	1.02	0.12	0.120
41H 110339 00	159.66	14.85	37.75	3.51	1.02	0.10	0.093
41H 110340 00	159.66	8.93	37.75	2.11	1.02	0.06	0.056
41H 132779 00	159.66	35.70	37.75	8.44	1.02	0.23	0.224
Combo 2	26.17		12.94		0.11		
41H 110336 00	26.17	0.99	12.94	0.49	0.11	0.00	0.038
41H 110337 00	26.17	5.79	12.94	2.86	0.11	0.02	0.221
41H 110338 00	26.17	3.15	12.94	1.56	0.11	0.01	0.121
41H 110339 00	26.17	2.45	12.94	1.21	0.11	0.01	0.094
41H 110340 00	26.17	1.47	12.94	0.73	0.11	0.01	0.056
41H 132779 00	26.17	5.89	12.94	2.91	0.11	0.03	0.225
Combo 3	203.26		6.18		0.73		
41H 110336 00	203.26	10.18	6.18	0.31	0.73	0.04	0.050
41H 110337 00	203.26	59.63	6.18	1.81	0.73	0.21	0.293
41H 110338 00	203.26	32.48	6.18	0.99	0.73	0.12	0.160
41H 110339 00	203.26	25.21	6.18	0.77	0.73	0.09	0.124
41H 110340 00	203.26	15.15	6.18	0.46	0.73	0.05	0.075
41H 132779 00	203.26	60.60	6.18	1.84	0.73	0.22	0.298
Combo 4	37.22		6.61		0.19		
41H 110336 00	37.22	1.14	6.61	0.20	0.19	0.01	0.031
41H 110337 00	37.22	6.69	6.61	1.19	0.19	0.03	0.180
41H 110338 00	37.22	3.65	6.61	0.65	0.19	0.02	0.098
41H 110339 00	37.22	2.83	6.61	0.50	0.19	0.01	0.076
41H 110340 00	37.22	1.70	6.61	0.30	0.19	0.01	0.046
41H 132779 00	37.22	6.80	6.61	1.21	0.19	0.03	0.183

Table 18. Summary of Proposed Diverted Volume for 384 irrigated acres when historic point of diversion and ditch in use (all units in AF, except for unitless "On Farm Efficiency")

	<u>Distributed</u> <u>Seepage Loss</u>	<u>Distributed</u> <u>Vegetation Loss</u>	<u>Distributed</u> <u>Ditch</u> <u>Evaporation</u>	<u>Distributed</u> <u>Conveyance</u> <u>Loss</u>
41H 110336 00	18.31	2.42	0.08	20.82
41H 110337 00	107.25	14.17	0.50	121.92
41H 110338 00	58.42	7.72	0.27	66.41
41H 110339 00	45.34	5.99	0.21	51.54
41H 110340 00	27.25	3.60	0.13	30.97
41H 132779 00	108.99	14.40	0.51	123.90
	365.56	48.30	1.69	415.56
	<u>HCV (minus IL)</u> <u>by water right</u>	<u>Distributed</u> <u>Conveyance Loss</u>	<u>Distributed PDV</u> <u>AF</u>	<u>On Farm</u> <u>Efficiency</u>
41H 110336 00	21.70	20.82	51.82	70%
41H 110337 00	127.10	121.92	303.49	70%
41H 110338 00	69.24	66.41	165.32	70%
41H 110339 00	53.73	51.54	128.31	70%
41H 110340 00	32.29	30.97	77.11	70%
41H 132779 00	129.17	123.90	308.43	70%

Proposed Instream Fishery Volume

40. The Department created a conceptual model for the instream fishery purpose (Table 19).

Table 19. Conceptual Instream Flow Model. Each square lists the elements that are summed to determine the protectable volume for that scenario.

	Along Protected Reach	Up to Historic Point of Diversion
Ditch not in use	HCV for retired acres	Volume applied to field for retired acres
	Retired acre return flows to other sources	Ditch evaporation: historic
	Ditch evaporation: historic	Ditch vegetation loss: historic
	Ditch vegetation loss: historic	Ditch Seepage: historic
Ditch in use	HCV for retired acres	Volume applied to field for retired acres
	Retired acre return flows to other sources	Ditch evaporation: retired acres
	Ditch evaporation: retired acres	Ditch vegetation loss: retired acres
	Ditch vegetation loss: retired acres	Ditch Seepage: retired acres

41. The Department calculated the consumptive volume for the retired acres using the same methods as for the proposed irrigation purpose, assuming 132.68 acres retired. Table 20 overviews the retired acres consumptive volume calculations.

Table 20. Retired Acres Consumptive Volume Calculations

Consumptive Volume (CV) of Retired Acres	Bozeman MT State Flood/Sprinkler ET (Inches)	Gallatin County 1964-1973 Management Factor (Percent)	Retired Acres	Retired CV AF (minus IL)	On-farm Efficiency	Field Application AF	Retired Irrecoverable Losses (IL) Sprinkler 10%:	Retired CV AF (Including IL)
	18.42	73.5%	132.7	149.7	70%	213.9	21.4	171.10
Water Right	Flow Rate	Flow Rate Propotion	Retired CV (minus IL) by water right	Retired CV (inc. IL) by water right	Retired Field Application AF by water right	Total Flow Rate		
41H 110336 00	0.84	0.05	7.50	8.57	10.71	16.77		
41H 110337 00	4.92	0.29	43.92	50.20	62.75	16.77		
41H 110338 00	2.68	0.16	23.93	27.34	34.18	16.77		
41H 110339 00	2.08	0.12	18.57	21.22	26.53	16.77		
41H 110340 00	1.25	0.07	11.16	12.75	15.94	16.77		
41H 132779 00	5.00	0.30	44.64	51.01	63.77	16.77		

42. The Department calculated the conveyance losses associated with the retired acres by subtracting the proposed irrigation conveyance losses from the historic conveyance losses (Table 21).

Table 21. Retired Acres Conveyance Loss (all units in AF)

	HISTORIC	PROPOSED	RETIRED ACRES
	Distributed Seepage Loss	Distributed Seepage Loss	Distributed Seepage Loss
41H 110336 00	20.18	18.31	1.87
41H 110337 00	118.22	107.25	10.97
41H 110338 00	64.39	58.42	5.97
41H 110339 00	49.98	45.34	4.64
41H 110340 00	30.03	27.25	2.79
41H 132779 00	120.14	108.99	11.15
TOTAL	402.94	365.56	37.38
	Distributed Vegetation Loss	Distributed Vegetation Loss	Distributed Vegetation Loss
41H 110336 00	2.42	2.42	0.00
41H 110337 00	14.17	14.17	0.00
41H 110338 00	7.72	7.72	0.00
41H 110339 00	5.99	5.99	0.00
41H 110340 00	3.60	3.60	0.00
41H 132779 00	14.40	14.40	0.00
TOTAL	48.30	48.30	0.00
	Distributed Ditch Evaporation	Distributed Ditch Evaporation	Distributed Ditch Evaporation
41H 110336 00	0.09	0.08	0.01
41H 110337 00	0.53	0.50	0.04
41H 110338 00	0.29	0.27	0.02
41H 110339 00	0.23	0.21	0.02
41H 110340 00	0.14	0.13	0.01
41H 132779 00	0.54	0.51	0.04
TOTAL	1.82	1.69	0.12
	Distributed Conveyance Loss	Distributed Conveyance Loss	Distributed Conveyance Loss
41H 110336 00	22.69	21.13	1.56
41H 110337 00	132.92	123.77	9.15
41H 110338 00	72.40	67.42	4.98
41H 110339 00	56.19	52.33	3.87
41H 110340 00	33.77	31.45	2.32
41H 132779 00	135.08	125.79	9.30
TOTAL	453.06	421.89	31.18

43. The DNRC Water Management Bureau completed a Return Flow Report on 05/12/2022. In the Return Flow Report, the Water Management Bureau identifies three sources that the return flows associated with the retired acres return to: East Gallatin River, South Fork Ross Creek, and Trout Creek. South Fork Ross Creek and Trout Creek are not the same source as the historic point of diversion and represent water consumed from the source that can also be protected for temporary instream fishery benefit. The Return Flow Report identified 17.3 AF return flows to East Gallatin River, 12.7 AF to Trout Creek, and 12.7 AF to South Fork Ross Creek. The Department apportioned the water consumed from the source by flow rate proportion (Table 22).

Table 22. Return Flows to a Different Source

WR	FLOW RATE PROPORTION	Return Flows to Trout and SF Ross
41H 110336 00	0.050	1.27
41H 110337 00	0.293	7.45
41H 110338 00	0.160	4.06
41H 110339 00	0.124	3.15
41H 110340 00	0.075	1.89
41H 132779 00	0.298	7.57
	1.000	25.40

44. The Department calculated the protectable flows for the instream fishery for four scenarios: A) up to the historic point of diversion and historic ditch not in use, B) along the Protected Reach and historic ditch not in use, C) up to the historic point of diversion and historic ditch in use, and D) along the Protected Reach and historic ditch in use (Table 23).

Table 23. Protectable Volumes

	<u>HCV:</u> <u>Retired</u> <u>Acres</u>	<u>Field</u> <u>Applied:</u> <u>Retired</u> <u>Acres</u>	<u>Historic</u> <u>Ditch</u> <u>Evaporation</u>	<u>Historic</u> <u>Ditch</u> <u>Vegetation</u> <u>Loss</u>	<u>Historic</u> <u>Ditch</u> <u>Seepage</u>	<u>Retired Acre</u> <u>Return Flows</u> <u>to Another</u> <u>Source</u>	<u>TOTAL</u> <u>PROTECTABLE</u> <u>VOLUME (AF)</u>	<u>Elements that compose</u> <u>protectable volume</u>
<i>Ditch not in Use</i>								
Historic POD	N/A	213.88	1.82	48.30	402.94	N/A	666.94	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	171.10	N/A	1.82	48.30	N/A	25.4	246.62	Historic Ditch Evaporation, Vegetation Loss
<i>Ditch in Use</i>								
Historic POD	N/A	213.88	0.12	0.00	37.38	N/A	251.39	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	171.10	N/A	0.12	0.00	N/A	25.4	196.63	Retired Ditch Evaporation, Vegetation Loss
41H 110336 00								
<i>Ditch not in Use</i>								
Historic POD	N/A	10.71	0.09	2.42	20.18	N/A	33.41	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	8.57	N/A	0.09	2.42	N/A	1.27	12.35	Historic Ditch Evaporation, Vegetation Loss
<i>Ditch in Use</i>								
Historic POD	N/A	10.71	0.01	0.00	1.87	N/A	12.59	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	8.57	N/A	0.01	0.00	N/A	1.27	9.85	Retired Ditch Evaporation, Vegetation Loss

41H 110337 00								
Ditch not in Use								
Historic POD	N/A	62.75	0.53	14.17	118.22	N/A	195.67	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	50.20	N/A	0.53	14.17	N/A	7.45	72.35	Historic Ditch Evaporation, Vegetation Loss
Ditch in Use								
Historic POD	N/A	62.75	0.04	0.00	10.97	N/A	73.75	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	50.20	N/A	0.04	0.00	N/A	7.45	57.69	Retired Ditch Evaporation, Vegetation Loss
41H 110338 00								
Ditch not in Use								
Historic POD	N/A	34.18	0.29	7.72	64.39	N/A	106.58	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	27.34	N/A	0.29	7.72	N/A	4.06	39.41	Historic Ditch Evaporation, Vegetation Loss
Ditch in Use								
Historic POD	N/A	34.18	0.02	0.00	5.97	N/A	40.17	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	27.34	N/A	0.02	0.00	N/A	4.06	31.42	Retired Ditch Evaporation, Vegetation Loss
41H 110339 00								
Ditch not in Use								
Historic POD	N/A	26.53	0.23	5.99	49.98	N/A	82.72	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	21.22	N/A	0.23	5.99	N/A	3.15	30.59	Historic Ditch Evaporation, Vegetation Loss
Ditch in Use								
Historic POD	N/A	26.53	0.02	0.00	4.64	N/A	31.18	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	21.22	N/A	0.02	0.00	N/A	3.15	24.39	Retired Ditch Evaporation, Vegetation Loss
41H 110340 00								
Ditch not in Use								
Historic POD	N/A	15.94	0.14	3.60	30.03	N/A	49.71	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	12.75	N/A	0.14	3.60	N/A	1.89	18.38	Historic Ditch Evaporation, Vegetation Loss
Ditch in Use								
Historic POD	N/A	15.94	0.01	0.00	2.79	N/A	18.74	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	12.75	N/A	0.01	0.00	N/A	1.89	14.66	Retired Ditch Evaporation, Vegetation Loss

41H 132779 00								
Ditch not in Use								
Historic POD	N/A	63.77	0.54	14.40	120.14	N/A	198.85	Historic Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	51.01	N/A	0.54	14.40	N/A	7.57	73.53	Historic Ditch Evaporation, Vegetation Loss
Ditch in Use								
Historic POD	N/A	63.77	0.04	0.00	11.15	N/A	74.95	Retired Ditch Evaporation, Vegetation Loss, Seepage
Protected Reach	51.01	N/A	0.04	0.00	N/A	7.57	58.62	Retired Ditch Evaporation, Vegetation Loss

45. The Department calculated the volume that could be achieved assuming continuous flow at the proposed instream flow rates for 110 days. The Department then calculated the number of days before the maximum protectable volume is reached (Table 24).

Table 24. Flow Rates vs. Protectable Volumes under four Operations Scenarios: A) ditch not in use, protectable volume up to the historic POD, B) ditch not in use, protectable volume along the Protected Reach, C) ditch in use, protectable volume up to the historic POD, and D) ditch in use, protectable volume along the Protected Reach.

DITCH NOT IN USE: UP TO HISTORIC POD						
Water Right	# Days	Protected CFS	AF Based on CFS	Protected AF	Conversion CFS to AF/day	# Days Until AF Reached
41H 110336 00	110	0.59	128.73	33.41	1.9835	29
41H 110337 00	110	3.45	752.74	195.67	1.9835	29
41H 110338 00	110	1.88	410.19	106.58	1.9835	29
41H 110339 00	110	1.46	318.55	82.72	1.9835	29
41H 110340 00	110	0.88	192.00	49.71	1.9835	28
41H 132779 00	110	3.51	765.83	198.85	1.9835	29
TOTAL	110	11.77	2568.04	666.94	1.9835	29
DITCH NOT IN USE: ALONG PROTECTED REACH						
Water Right	# Days	Protected CFS	AF Based on CFS	Protected AF	Conversion CFS to AF/day	# Days Until AF Reached
41H 110336 00	110	0.59	128.73	12.35	1.9835	11
41H 110337 00	110	3.45	752.74	72.35	1.9835	11
41H 110338 00	110	1.88	410.19	39.41	1.9835	11
41H 110339 00	110	1.46	318.55	30.59	1.9835	11
41H 110340 00	110	0.88	192.00	18.38	1.9835	11
41H 132779 00	110	3.51	765.83	73.53	1.9835	11
TOTAL	110	11.77	2568.04	246.62	1.9835	11

DITCH IN USE: UP TO HISTORIC POD						
Water Right	# Days	Protected CFS	AF Based on CFS	Protected AF	Conversion CFS to AF/day	# Days Until AF Reached
41H 110336 00	110	0.59	128.73	12.59	1.9835	11
41H 110337 00	110	3.45	752.74	73.75	1.9835	11
41H 110338 00	110	1.88	410.19	40.17	1.9835	11
41H 110339 00	110	1.46	318.55	31.18	1.9835	11
41H 110340 00	110	0.88	192.00	18.74	1.9835	11
41H 132779 00	110	3.51	765.83	74.95	1.9835	11
TOTAL	110	11.77	2568.04	251.39	1.9835	11
DITCH IN USE: ALONG PROTECTED REACH						
Water Right	# Days	Protected CFS	AF Based on CFS	Protected AF	Conversion CFS to AF/day	# Days Until AF Reached
41H 110336 00	110	0.59	128.73	9.85	1.9835	8
41H 110337 00	110	3.45	752.74	57.69	1.9835	8
41H 110338 00	110	1.88	410.19	31.42	1.9835	8
41H 110339 00	110	1.46	318.55	24.39	1.9835	8
41H 110340 00	110	0.88	192.00	14.66	1.9835	8
41H 132779 00	110	3.51	765.83	58.62	1.9835	8
TOTAL	110	11.77	2568.04	196.63	1.9835	8

46. The maximum protectable volumes will be reached before the end of 110 days for every water right in every scenario using the flow rates proposed in the application.

Proposed Instream Fishery Flow Rates

47. The Consultant proposed new instream flow rates that will not exceed the protectable volume (email chain dated 12/30/2022 from Megan Casey, Trout Unlimited, to Shannon Baumgardner, DNRC). The Consultant proposed two scenarios for operation of the Protected Reach, one when the ditch is not in use and one for when the ditch is in use (Table 25). The Consultant did not propose scenarios for the volumes protectable up to the historic point of diversion, below which the return flows historically accrued. The four scenarios developed by Department are entitled Scenarios A-D, while the two scenarios developed by the Consultant are entitled Scenarios 1-2.

Table 25. Instream Flow Operation Plan (email chain between Consultant and DNRC, dated 12/30/2021)

SCENARIO 1. FLANNERY DITCH NOT IN USE: 213.88 af (HCV) Protectable in Protected Reach				
Table 1. ISF through Protected Reach by Month				
Period: July 16 - Sept 15 (61 days) @ 1.77 cfs				
Calculation: 1.77 cfs x 1.98 = 3.5 af/day x 61 days = 213.8				
	Proportion	af/mo	cfs	days/mo
Jan	0	0	0	0
Feb	0	0	0	0
Mar	0	0	0	0
Apr	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0.25	53.47	1.77	15
Aug	0.5	106.94	1.77	31
Sept	0.25	53.47	1.77	15
Oct	0	0	0	0
Nov	0	0	0	0
Dec	0	0	0	0
Total	1.00	213.88	1.77	61
Table 2. ISF through Protected Reach by Water Right				
Calculation, Flow: Protectable Flow (1.77 cfs) x WR Proportion				
Calculation, Vol: Total HCV (213.88 af) x WR Proportion				
Water Right	Proportion	Flow Rate	Volume	
41H 110336 00	0.05	0.09	10.69	
41H 110337 00	0.29	0.51	62.03	
41H 110338 00	0.16	0.28	34.22	
41H 110339 00	0.12	0.21	25.67	
41H 110340 00	0.08	0.14	17.11	
41H 132779 00	0.30	0.53	64.16	
Total	1.00	1.77	213.88	
SCENARIO 2. FLANNERY DITCH IN USE: 196.63 af (HCV) Protectable in Protected Reach				
Table 1. ISF through Protected Reach by Month				
Period: July 16 - Sept 15 (61 days) @ 1.62 cfs				
Calculation: 1.62 cfs x 1.98 = 3.2 af/day x 61 days = 196.63				
	Proportion	af/mo	cfs	days/mo
Jan	0	0	0	0
Feb	0	0	0	0
Mar	0	0	0	0
Apr	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0.25	49.16	1.62	15
Aug	0.5	98.32	1.62	31
Sept	0.25	49.16	1.62	15
Oct	0	0	0	0
Nov	0	0	0	0
Dec	0	0	0	0
Total	1.00	196.63	1.62	61
Table 2. ISF through Protected Reach by Water Right				
Calculation, Flow: Protectable Flow (1.62 cfs) x WR Proportion				
Calculation, Vol: Total HCV (196.63 af) x WR Proportion				
Water Right	Proportion	Flow Rate	Volume	
41H 110336 00	0.05	0.08	9.83	
41H 110337 00	0.29	0.47	57.02	
41H 110338 00	0.16	0.26	31.46	
41H 110339 00	0.12	0.19	23.60	
41H 110340 00	0.08	0.13	15.73	
41H 132779 00	0.30	0.49	58.99	
Total	1.00	1.62	196.63	

48. With approval of the consultant (email chain dated 12/30/2022 from Megan Casey, Trout Unlimited, to Shannon Baumgardner, DNRC), the Department modified the operation plan for Scenario 1 to use the full protectable volume, 246.62 AF, rather than the 213.88 AF that was proposed by the Consultant (Table 25). The formula used to determine monthly volume differed slightly between consultant and DNRC. The consultant multiplied the protectable volume by a proportion for each month, whereas the Department multiplied the number of days in month by flow rate and by conversion factor. Both methods end up with the same protectable volume, but the Department's method produced a more accurate monthly breakdown of protected volumes (Table 26 and Table 27). The Consultant approved the Department's method in an email (email chain dated 12/30/2022 from Megan Casey, Trout Unlimited, to Shannon Baumgardner, DNRC).

Table 26. Operation Plan, Scenario 1

Scenario 1 (DNRC): Flannery Ditch not in use				
Flow (CFS)	CFS to AF/day	AF/day	Days	AF/Year
2.04	1.98	4.04	61	246.4
	Days/Mo	CFS	AF/M	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	2.04	60.6	
August	31	2.04	125.2	
September	15	2.04	60.6	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			246.4	

Table 27. Operation Plan, Scenario 2

Scenario 2 (DNRC): Flannery Ditch in use				
Flow (CFS)	CFS to AF/day	AF/day	Days	AF/Year
1.62	1.98	3.21	61	195.7
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	1.62	48.1	
August	31	1.62	99.4	
September	15	1.62	48.1	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			195.7	

Comparison between Old and New Consumptive Volumes

49. The proposed new use consumptive use is the sum of the Proposed Irrigation Consumptive Volume and the protectable instream fishery volume consumed from the source. The maximum protectable instream fishery volume consumed from the source, when the ditch is

not in use, is the Consumptive Volume (including IL) of the retired acres + ditch evaporation + ditch vegetation loss + retired acres return flows that go to a different source. The retired acres consumptive volume and proposed irrigation consumptive volume is equal to the historic consumptive volume (Table 28).

Table 28. Historic Consumptive Volume - Proposed Consumptive Volume

Water Right	Historic Consumptive Volume	Proposed Irrigation Consumptive Volume	Retired CV (inc. IL) by water right	Historic Consumptive Volume - Proposed Consumptive Volume
41H 110336 00	33.37	24.80	8.57	0.0
41H 110337 00	195.45	145.26	50.20	0.0
41H 110338 00	106.47	79.13	27.34	0.0
41H 110339 00	82.63	61.41	21.22	0.0
41H 110340 00	49.66	36.91	12.75	0.0
41H 132779 00	198.63	147.62	51.01	0.0

The remaining components of volume consumed from the source would be the same for the historic use as for the proposed use, as the ditch conveyance remains the same and a portion of the return flows would historically have returned to a different source.

50. The Department finds the historic consumptive use and volume consumed from the source to be equal to the proposed consumptive volume and volume consumed from the source.

Return Flows

51. The permanent change does not involve a change in place of use and will not cause a change in return flows volume or timing.

52. For the temporary change, the Department analyzed the location and timing of return flows in a 5/12/2022 Return Flow Report. This report concluded that return flows would accrue to East Gallatin River, South Fork Ross Creek, and Trout Creek. On April 1, 2016, the Department issued a policy memorandum explaining how return flows will be analyzed in all applications. As described in the April 1, 2016, memorandum, water under these water rights will be “left instream so historically diverted flows are available during the historic period of diversion either below the point of diversion or where return flows historically returned to the source.” This application did not meet that criterion because a portion of the return flows return to different sources, so a monthly analysis of return flow timing was performed.

53. The 05/12/2022 Return Flow Report breaks down the return flows associated with the retired acres to a monthly timestep. Table 29 summarizes the findings of the report.

Table 29. Return Flow Report, p. 4

	IWR (in) – MSU	Applied (AF)	Consumed (AF)	Non- consumed (AF)	Return Flows (AF)		
					East Gallatin River	Trout Creek	SF Ross Creek
January	0.00	0.0	0.0	0.0	1.4	1.1	1.1
February	0.00	0.0	0.0	0.0	1.4	1.1	1.1
March	0.00	0.0	0.0	0.0	1.4	1.1	1.1
April	0.00	0.0	0.0	0.0	1.4	1.1	1.1
May	0.23	3.6	2.9	0.7	1.4	1.1	1.1
June	3.12	49.2	39.4	9.8	1.4	1.1	1.1
July	4.87	76.9	61.5	15.4	1.4	1.1	1.1
August	4.10	64.8	51.8	13.0	1.4	1.1	1.1
September	1.23	19.4	15.5	3.9	1.4	1.1	1.1
October	0.00	0.0	0.0	0.0	1.4	1.1	1.1
November	0.00	0.0	0.0	0.0	1.4	1.1	1.1
December	0.00	0.0	0.0	0.0	1.4	1.1	1.1
Total	13.54	213.9	171.1	42.8	17.3	12.7	12.7

54. The Water Management Bureau modeled the net effect on flows in East Gallatin River, Trout Creek, and South Fork Ross Creek. The receiving reach for return flows on the East Gallatin River begins downstream of the historic point of diversion in Section 10, T1S, R5E. The net effects on return flow for East Gallatin River are not considered per the Return Flow Policy Memo (Davis, 2016) because the water is left instream so historically diverted flows are available during the historical period of diversion. Figure 6 shows the receiving reaches of South Fork Ross Creek and Trout Creek that experience the net effect on flows.

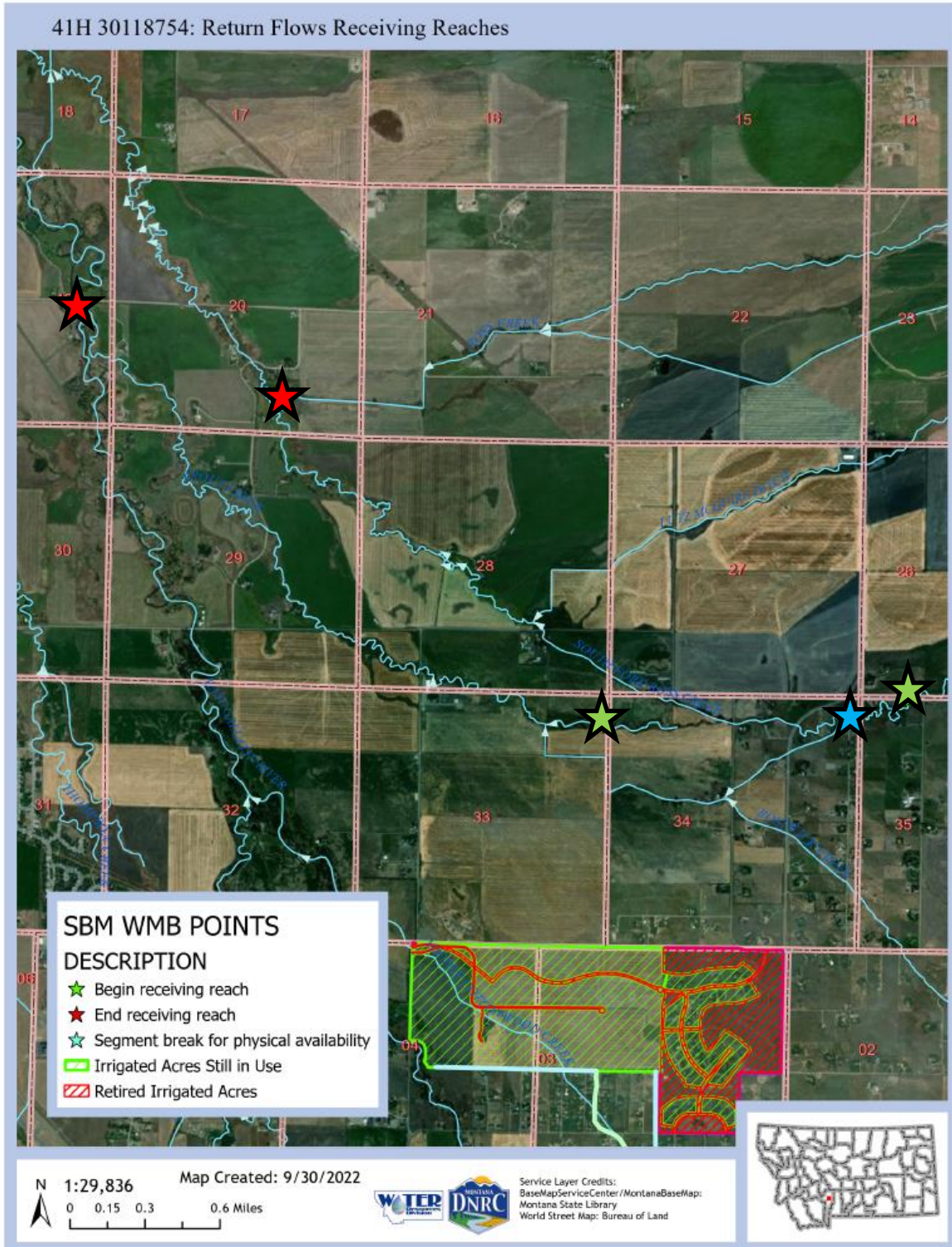


Figure 6. Return Flows Receiving Reaches

55. The net effect on flows found by the Water Management Bureau (Table 30) is shown as a volume. The Department back calculated the flow rate of the net effect (Table 31). South Fork Ross Creek was divided into two segments to align with the physical availability model (see details below).

Table 30. Return Flow Report, p. 4

Net Effect on Stream Flows (AF)						
	Trout Creek	SF Ross Creek	East Gallatin River			
			Reach 1	Reach 2	Reach 3	Reach 4
January	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
February	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
March	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
April	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
May	-1.1	-1.1	1.4	-0.7	-1.8	-2.8
June	-1.1	-1.1	36.9	8.4	7.3	6.3
July	-1.1	-1.1	58.4	13.9	12.9	11.8
August	-1.1	-1.1	49.0	11.5	10.5	9.4
September	-1.1	-1.1	13.7	2.4	1.4	0.3
October	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
November	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6
December	-1.1	-1.1	-1.4	-1.4	-2.5	-3.6

Table 31. Net Effects on Return Flows as a Flow Rate

	Trout Creek		SF Ross Creek- Total			SF Ross Creek- Segment 1				SF Ross Creek- Segment 2			
	AF	CFS*	Distance	AF	CFS	Distance	Ratio	AF	CFS	Distance	Ratio	AF	CFS
January	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
February	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
March	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
April	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
May	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
June	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
July	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
August	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
September	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
October	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
November	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016
December	-1.1	-0.02	23826	-1.1	-0.02	3284	0.138	-0.15	-0.003	20542	0.862	-0.95	-0.016

56. Discharge data was not available for South Fork Ross Creek and Trout Creek, and StreamStats could not be used to model discharge because of the small drainage area and prominence of groundwater inputs. To determine physical availability, the Department used a physical availability model developed by the Water Management Bureau (Table 32).

Table 32. Physical Availability

Physical Availability						
	S.F. Ross Creek				Trout Creek	
	Segment 1		Segment 2			
	AF/mo	cfs*	AF/mo	cfs*	AF/mo	cfs*
January	94.9	1.58	159.4	2.65	151	2.51
February	74.3	1.23	124.9	2.07	141	2.34
March	81.9	1.36	137.6	2.28	157.7	2.62
April	101.8	1.69	171	2.84	169	2.81
May	169	2.81	283.9	4.71	200.1	3.32
June	241.3	4.01	405.4	6.73	197.3	3.28
July	230.3	3.82	387	6.42	176.9	2.94
August	186.6	3.10	313.5	5.20	161	2.67
September	166.8	2.77	280.2	4.65	160.5	2.66
October	125.1	2.08	210.2	3.49	165.6	2.75
November	108.4	1.80	182	3.02	154.4	2.56
December	103.6	1.72	174	2.89	153	2.54

57. The Department tallied all legal demands for South Fork Ross Creek and Trout Creek in the receiving reaches (Table 33). South Fork Ross Creek was divided into two segments to align with the physical availability model. The Department assigned a volume and flow rate to stock rights without a decreed volume and flow rate assuming 30 gallons per day per animal unit and a flow rate back calculated from volume. The Department assigned a volume to irrigation rights with no decreed volume by assuming 2 AF/acre, a conservative estimate for Irrigation Climatic Area IV, and supplemental water rights from multiple sources serve the acres proportionately to their flow rate (see Technical Report, Appendix, Table 27 for more details).

Table 33. Legal Demands

	TROUT CK			SF ROSS SEGMENT 1			SF ROSS SEGMENT 2		
	AF	GPM	CFS	AF	GPM	CFS	AF	GPM	CFS
January	0.74	5.43	0.01	0.04	0.31	0.00	0.43	3.17	0.01
February	0.67	5.43	0.01	0.04	0.31	0.00	0.39	3.17	0.01
March	0.74	5.43	0.01	0.04	0.31	0.00	0.43	3.17	0.01
April	31.97	2681.65	5.92	0.04	0.31	0.00	26.63	809.93	1.80
May	89.39	4081.71	9.04	0.04	0.31	0.00	152.87	1482.19	3.30
June	89.36	4081.71	9.04	0.04	0.31	0.00	152.86	1482.19	3.30
July	89.39	4081.71	9.04	0.04	0.31	0.00	152.87	1482.19	3.30
August	89.39	4081.71	9.04	0.04	0.31	0.00	152.87	1482.19	3.30
September	89.36	4081.71	9.04	0.04	0.31	0.00	52.86	808.94	1.80
October	31.08	4082.32	9.04	0.04	0.31	0.00	51.51	808.94	1.80
November	0.72	5.43	0.01	0.04	0.31	0.00	0.42	3.17	0.01
December	0.74	5.43	0.01	0.04	0.31	0.00	0.43	3.17	0.01
	513.55	27199.65	60.22	0.50	3.75	0.01	744.58	8372.38	18.63

The Department calculated legal availability for Trout Creek and South Fork Ross Creek by subtracting legal demands from physical availability, then subtracting net effect on flows from legal availability (Table 34).

Table 34. Legal Availability

TROUT CREEK										
	Physical Availability		Legal Demands		Legal Availability		Net Depletion		Legal Availability - Net Depletion	
	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs
January	151.00	2.51	0.74	0.01	150.26	2.49	1.10	0.02	149.16	2.48
February	141.00	2.34	0.67	0.01	140.33	2.33	1.10	0.02	139.23	2.31
March	157.70	2.62	0.74	0.01	156.96	2.61	1.10	0.02	155.86	2.59
April	169.00	2.81	31.97	5.92	137.03	-3.11	1.10	0.02	135.93	-3.13
May	200.10	3.32	89.39	9.04	110.71	-5.72	1.10	0.02	109.61	-5.74
June	197.30	3.28	89.36	9.04	107.94	-5.76	1.10	0.02	106.84	-5.78
July	176.90	2.94	89.39	9.04	87.51	-6.10	1.10	0.02	86.41	-6.12
August	161.00	2.67	89.39	9.04	71.61	-6.37	1.10	0.02	70.51	-6.39
September	160.50	2.66	89.36	9.04	71.14	-6.38	1.10	0.02	70.04	-6.39
October	165.60	2.75	31.08	9.04	134.52	-6.29	1.10	0.02	133.42	-6.31
November	154.40	2.56	0.72	0.01	153.68	2.55	1.10	0.02	152.58	2.53
December	153.00	2.54	0.74	0.01	152.26	2.53	1.10	0.02	151.16	2.51

SF ROSS CREEK SEGMENT 1										
	Physical Availability		Legal Demands		Legal Availability		Net Depletion		Legal Availability - Net Depletion	
	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs
January	94.90	1.58	0.04	0.001	94.86	1.57	0.15	0.003	94.71	1.57
February	74.30	1.23	0.04	0.001	74.26	1.23	0.15	0.003	74.11	1.23
March	81.90	1.36	0.04	0.001	81.86	1.36	0.15	0.003	81.71	1.36
April	101.80	1.69	0.04	0.001	101.76	1.69	0.15	0.003	101.61	1.69
May	169.00	2.81	0.04	0.001	168.96	2.80	0.15	0.003	168.81	2.80
June	241.30	4.01	0.04	0.001	241.26	4.00	0.15	0.003	241.11	4.00
July	230.30	3.82	0.04	0.001	230.26	3.82	0.15	0.003	230.11	3.82
August	186.60	3.10	0.04	0.001	186.56	3.10	0.15	0.003	186.41	3.09
September	166.80	2.77	0.04	0.001	166.76	2.77	0.15	0.003	166.61	2.77
October	125.10	2.08	0.04	0.001	125.06	2.08	0.15	0.003	124.91	2.07
November	108.40	1.80	0.04	0.001	108.36	1.80	0.15	0.003	108.21	1.80
December	103.60	1.72	0.04	0.001	103.56	1.72	0.15	0.003	103.41	1.72

	SF ROSS CREEK SEGMENT 2									
	Physical Availability		Legal Demands		Legal Availability		Net Depletion		Legal Availability - Net Depletion	
	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs	AF/mo	cfs
January	159.40	2.65	0.43	0.01	158.97	2.64	0.95	0.02	158.02	2.62
February	124.90	2.07	0.39	0.01	124.51	2.07	0.95	0.02	123.56	2.05
March	137.60	2.28	0.43	0.01	137.17	2.28	0.95	0.02	136.22	2.26
April	171.00	2.84	26.63	1.80	144.37	1.04	0.95	0.02	143.42	1.02
May	283.90	4.71	152.87	3.30	131.03	1.41	0.95	0.02	130.09	1.40
June	405.40	6.73	152.86	3.30	252.54	3.43	0.95	0.02	251.59	3.42
July	387.00	6.42	152.87	3.30	234.13	3.13	0.95	0.02	233.19	3.11
August	313.50	5.20	152.87	3.30	160.63	1.91	0.95	0.02	159.69	1.89
September	280.20	4.65	52.86	1.80	227.34	2.85	0.95	0.02	226.39	2.84
October	210.20	3.49	51.51	1.80	158.69	1.69	0.95	0.02	157.74	1.68
November	182.00	3.02	0.42	0.01	181.58	3.01	0.95	0.02	180.63	3.00
December	174.00	2.89	0.43	0.01	173.57	2.88	0.95	0.02	172.62	2.87

58. The net effect on flows when subtracted from legal availability is positive for volume and flow rate in both segments of South Fork Ross Creek, positive for volume in Trout Creek, but negative for flow rate in Trout Creek. All water rights in the receiving reach of Trout Creek predate the six water rights involved in this change and would not have been reliant on return flows from the six water rights involved in this change at the time they were established.

59. The Department finds the change in volume of return flows will not adversely affect other water users on South Fork Ross Creek or Trout Creek.

60. For return flows that go to East Gallatin River, the temporary change in purpose to instream flows meets the requirements of the memo "Policy Memo – Return Flows" (Davis, 4/1/2016) because water is left instream at the historic point of diversion so historically diverted flows are available during the historic period of diversion. The Department finds the temporary change to instream flow will not adversely affect other water users on the East Gallatin River.

61. The Department finds there are no changes in return flows that will occur for the historic place of diversion still irrigated and therefore there is no adverse effect due to return flows.

General Adverse Effect Findings

62. No water rights are supplemental to those being changed. The unchanged portion of the water rights, corresponding with the subdivision, will remain in irrigation but will not have access to the new point of diversion. The domestic and lawn and garden needs of the subdivision will be met by groundwater certificates.

63. Multiple water rights are still authorized to use the historic point of diversion and Conveyance Ditch (41H 141870 00, 41H 126736 00, 41H 140886 00, and 41H 72309 00). Applicant asserts the only other water right owner on the Conveyance Ditch that still actively uses their water rights, Heidecker, agrees to closing the ditch and diverts upstream of the historic point of diversion. Applicant asserts no water right holder has used the Conveyance Ditch since the Applicant has owned the property or since the ditch fell into disrepair. Applicant will remove rock and fill barrier to the Conveyance Ditch if any water right owner expresses interest in restarting use of the Conveyance Ditch.

64. The permanent new point of diversion is downstream of the historic point of diversion. Water stays in the source longer before being diverted. Two water rights that are senior to the Spain Bridge Meadows water rights are in the Protected Reach (Deficiency Response). All water rights downstream of the proposed pumps are junior to the water rights in this change (Deficiency Response). The Applicant cannot call rights it could not previously call. All water rights before the pump site are senior to the changed water rights, so no additional water rights can be called for the irrigation purpose on account of moving the point of diversion downstream. Only water consumed from the source is callable along the Protected Reach, and this water would not have been historically available for junior water users. The Spain Bridge Meadows water rights have always been available to use to their full extent without a history of calls during the time the Applicant has owned the property, resulting in no greater access to water that previously would have gone to others (Deficiency Response).

65. Applicant can prevent adverse effect to water right holders along the Protected Reach by measuring at the start and end of the Protected Reach. Applicant can use these measurements to respond to call and to ensure protected flows plus the irrigation diversions do not exceed historic flow rates and volumes.

66. The historic timing of diversion remains the same. For the irrigated acres, the pattern and timing of irrigation remain the same. Instream flows are only protectable during the historic period of diversion.

67. The proposed temporary and permanent changes will not adversely affect other water users.

BENEFICIAL USE

FINDINGS OF FACT

68. Applicant proposes to use water for an instream fishery purpose and an irrigation purpose. All six water rights will permanently remain with an irrigation purpose and will temporarily have an additional instream fishery purpose. Instream flow to benefit the fishery resources and irrigation are both recognized beneficial uses of water in the State of Montana.

69. The Protected Reach extends from the historic point of diversion on the East Gallatin River to the confluence of East Gallatin River and Hyalite Creek. The Applicant proposes this as the area reasonably expected to be affected by historic diversions. The Return Flow Report identifies net effect on stream flows in the East Gallatin River past the proposed downstream end of the Protected Reach, all the way to the confluence with Ross Creek. This lends weight to the assertion that historic diversions and their return flows had an effect throughout the Protected Reach. The Department finds it reasonable that historic use affected available flows on the East Gallatin River from the historic point of diversion to the confluence with Hyalite Creek.

70. Maintaining instream flows in East Gallatin River will benefit wild trout populations because of improved water quality and habitat conditions. Applicant asserts low flows on this stretch of the East Gallatin River cause high algae growth and a persistent ammonia smell. The Department of Environmental Quality lists this stretch of East Gallatin River as impaired. Montana Department of Fish, Wildlife, and Parks has a water reservation for 90 CFS on this section of the East Gallatin River. US Geological Survey stream gage records from the Bozeman Wastewater Treatment Facility, 4.5 miles upstream from historic point of diversion, show the discharge rarely exceeds 90 CFS after June 23. Applicant asserts instream flows will cause the reservation to be met more often. Applicant asserts increased mid-summer flows will decrease water temperature, improve ability to dilute pollutants, and increase oxygen levels. The Department finds it reasonable that increasing mid-summer flows in East Gallatin River will benefit water quality and wild trout habitat.

71. Applicant has proven by a preponderance of evidence that leaving additional water instream for the fishery resource in East Gallatin River for the duration of the temporary change is a beneficial use and that the amount proposed for change (2.04 CFS for 61 days in the period of use, totaling 246.62 AF, along the Protected Reach when the historic point of diversion is not in use and 1.62 CFS for 61 days in the period of use, totaling 196.63 AF, when the historic point of diversion is in use) is the amount reasonably required to accomplish that purpose.

72. The Department finds that for the duration of the temporary change, the unchanged irrigation in the amount of 5 CFS for 384 acres is a beneficial use of water.

ADEQUATE DIVERSION

FINDINGS OF FACT

Permanent Additional Point of Diversion

73. Two pumps are located at the proposed pump site. The Applicant installed these pumps at the proposed point of diversion in 2014. Each pumping plant is equipped with a Cornell 125 hp to supply the wheel lines for irrigation. One pump is capable of conveying 1240 GPM and the other 1000 GPM, for a total of 2240 GPM (5 CFS). The pumps were originally located at the historic point of diversion but as the channel degraded, were unable to operate effectively. The National Center for Appropriate Technology ("NCAT") conducted a pump analysis for Spain Bridge Meadows and provided options for meeting the irrigation system water needs. One option was moving the two pumps to the western half of the property (the proposed point of diversion). The NCAT analysis illustrates the pumps can provide the irrigation system water needs. The Department finds it reasonable that the two pumps at the proposed point of diversion are an adequate diversion.

Temporary Instream Flow Purpose

74. Pursuant to §85-2-402 (2)(b), MCA, the Applicant is not required to prove that the proposed means of diversion, construction, and operation of the appropriation works related to instream fishery purpose are adequate because this application involves (i) a change in appropriation right for instream flow pursuant to 85-2-320 or 85-2-436.

POSSESSORY INTEREST

FINDINGS OF FACT

Permanent Additional Point of Diversion

75. The applicant signed the affidavit on the application form affirming the applicant has possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use. (Department file)

Temporary Instream Flow Purpose

76. The temporary component of this application is for instream flow. Pursuant to § 85-2-402(2)(d)(ii), MCA, the Applicant is not required to prove that they have a possessory interest, or the written consent of the person with the possessory interest in the property where the water is to be put to beneficial use because this application involves a temporary change in appropriation right for instream flow per § 85-2-408, MCA.

INSTREAM FLOW CHANGE REQUIREMENTS

FINDINGS OF FACT

77. The Protected Reach runs along the East Gallatin River from the historic point of diversion at NWSWSE Section 10, T1S, R5E to the confluence with Hyalite Creek at SWSWNE Section 32, T1N, R5E, Gallatin County.

78. Applicant requested historic diverted volume between historic and proposed point of diversion. Downstream of proposed point of diversion to confluence of Hyalite Creek and East Gallatin River, Applicant requested 'instream component' (i.e., volume historically consumed from source) because return flows predicted to return to river just downstream of proposed diversion based on topography. The Department found return flows began to accrue just downstream of the historic point of diversion (Water Management Bureau, Attila Felnagy, Return Flow Report dated 5/12/2022). The Department found the historically diverted volume is protectable up to the historic point of diversion and the volume historically consumed from the source downstream of the historic point of diversion to the confluence of Hyalite Creek and East Gallatin River.

Operation Plan

79. The Department modified the Operation Plan with approval of the consultant (email chain dated 12/30/2022 from Megan Casey, Trout Unlimited, to Shannon Baumgardner, DNRC) to use the full protectable volume, 246.62 AF and to provide a more accurate monthly breakdown of protected volumes (see FOF 48 for more details). The following Operation Plans are the final products agreed to by the Applicant and Department (Table 39 and Table 40).

Table 39. Operation Plan, Scenario 1

Scenario 1 (DNRC): Flannery Ditch not in use				
Flow (CFS)	CFS to AF/day	AF/day	Days	AF/Year
2.04	1.98	4.04	61	246.4
	Days/Mo	CFS	AF/M	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	2.04	60.6	
August	31	2.04	125.2	
September	15	2.04	60.6	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			246.4	

Table 40. Operation Plan, Scenario 2

Scenario 2 (DNRC): Flannery Ditch in use				
Flow (CFS)	CFS to AF/day	AF/day	Days	AF/Year
1.62	1.98	3.21	61	195.7
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	1.62	48.1	
August	31	1.62	99.4	
September	15	1.62	48.1	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			195.7	

80. The protectable volumes at the proposed point of diversion are governed by Operation Plan 1 when the ditch is not in use and Operation Plan 2 when the ditch is in use. The protectable volumes at the historic point of diversion align with Scenario A and Scenario C.

Measurement Plan

81. Applicant originally proposed to measure streamflow at a suitable cross-section near the proposed point of diversion. The Water Rights Lease Agreement for Instream Flow specifies on page 4 that "Trout Unlimited shall implement whatever stream flow measurement devices and program that DNRC requires in approving the application for change". The Department requires measurements at the start and end of the Protected Reach for Instream Flow changes. Trout Unlimited agreed to measure at the start and end of the Protected Reach. Two measurement locations shall be selected that have suitable conditions and are as close as possible to the following points coinciding with the start and end of the Protected Reach: NWSWSE Section 10, T1S R5E and SWSWNE Section 32, T1 North, R5E, Gallatin County.

82. Applicant proposes to take a minimum of two measurements annually during the period of use, focusing on low flow conditions between July 15 and October 15.

83. Applicant will use USGS Partial Section methods and standards. Applicant will measure with a Marsh-McBirney 2000 Flow Meter.

CONCLUSIONS OF LAW

HISTORIC USE AND ADVERSE EFFECT

84. Montana's change statute codifies the fundamental principles of the Prior Appropriation Doctrine. Sections 85-2-401 and -402(1)(a), MCA, authorize changes to existing water rights, permits, and water reservations subject to the fundamental tenet of Montana water law that one may change only that to which he or she has the right based upon beneficial use. A change to an existing water right may not expand the consumptive use of the underlying right or remove the well-established limit of the appropriator's right to water actually taken and beneficially used. An increase in consumptive use constitutes a new appropriation and is subject to the new water use permit requirements of the MWUA. McDonald v. State, 220 Mont. 519, 530, 722 P.2d 598, 605 (1986)(beneficial use constitutes the basis, measure, and limit of a water right); Featherman v. Hennessy, 43 Mont. 310, 316-17, 115 P. 983, 986 (1911)(increased consumption associated with expanded use of underlying right amounted to new appropriation rather than change in use); Quigley v. McIntosh, 110 Mont. 495, 103 P.2d 1067, 1072-74 (1940)(appropriator may not expand a water right through the guise of a change – expanded use constitutes a new use with a new priority date junior to intervening water uses); Allen v. Petrick, 69 Mont. 373, 222 P. 451(1924)(“quantity of water which may be claimed lawfully under a prior appropriation is limited to that quantity within the amount claimed which the appropriator has needed, and which within a reasonable time he has actually and economically applied to a beneficial use. . . . it may be said that the principle of beneficial use is the one of paramount importance . . . The appropriator does not own the water. He has a right of ownership in its use only”); Town of Manhattan, at ¶ 10 (an appropriator's right only attaches to the amount of water actually taken and beneficially applied); Town of Manhattan v. DNRC, Cause No. DV-09-872C, Montana Eighteenth Judicial District Court, *Order Re Petition for Judicial Review*, Pg. 9 (2011)(the rule that one may change only that to which it has a right is a fundamental tenet of Montana water law and imperative to MWUA change provisions); In the Matter of Application to Change a Water Right No. 41I 30002512 by Brewer Land Co, LLC, DNRC Proposal For Decision and Final Order (2004).²

² DNRC decisions are available at:

http://www.dnrc.mt.gov/wrd/water_rts/hearing_info/hearing_orders/hearingorders.asp

85. Sections 85-2-401(1) and -402(2)(a), MCA, codify the prior appropriation principles that Montana appropriators have a vested right to maintain surface and ground water conditions substantially as they existed at the time of their appropriation; subsequent appropriators may insist that prior appropriators confine their use to what was actually appropriated or necessary for their originally intended purpose of use; and, an appropriator may not change or alter its use in a manner that adversely affects another water user. Spokane Ranch & Water Co. v. Beatty, 37 Mont. 342, 96 P. 727, 731 (1908); Quigley, 110 Mont. at 505-11, 103 P.2d at 1072-74; Matter of Royston, 249 Mont. at 429, 816 P.2d at 1057; Hohenlohe, at ¶¶43-45.³

86. The cornerstone of evaluating potential adverse effect to other appropriators is the determination of the “historic use” of the water right being changed. Town of Manhattan, at ¶10 (recognizing that the Department’s obligation to ensure that change will not adversely affect other water rights requires analysis of the actual historic amount, pattern, and means of water use). A change applicant must prove the extent and pattern of use for the underlying right proposed for change through evidence of the historic diverted amount, consumed amount, place of use, pattern of use, and return flow because a statement of claim, permit, or decree may not include the beneficial use information necessary to evaluate the amount of water available for change or potential for adverse effect.⁴ A comparative analysis of the historic use of the water right to the proposed change in use is necessary to prove the change will not result in expansion of the original right, or adversely affect water users who are entitled to rely upon maintenance of conditions on the source of supply for their water rights. Quigley, 103 P.2d at 1072-75 (it is necessary to ascertain historic use of a decreed water right to determine whether a change in use expands the underlying right to the detriment of other water user because a decree only provides a limited description of the right); Royston, 249 Mont. at 431-32, 816 P.2d at 1059-60 (record

³ See also Holmstrom Land Co., Inc., v. Newlan Creek Water District, 185 Mont. 409, 605 P.2d 1060 (1979); Lokowich v. Helena, 46 Mont. 575, 129 P. 1063(1913); Thompson v. Harvey, 164 Mont. 133, 519 P.2d 963 (1974)(plaintiff could not change his diversion to a point upstream of the defendants because of the injury resulting to the defendants); McIntosh v. Graveley, 159 Mont. 72, 495 P.2d 186 (1972)(appropriator was entitled to move his point of diversion downstream, so long as he installed measuring devices to ensure that he took no more than would have been available at his original point of diversion); Head v. Hale, 38 Mont. 302, 100 P. 222 (1909)(successors of the appropriator of water appropriated for placer mining purposes cannot so change its use as to deprive lower appropriators of their rights, already acquired, in the use of it for irrigating purposes); and, Gassert v. Noyes, 18 Mont. 216, 44 P. 959(1896)(change in place of use was unlawful where reduced the amount of water in the source of supply available which was subject to plaintiff’s subsequent right).

⁴A claim only constitutes *prima facie* evidence for the purposes of the adjudication under § 85-2-221, MCA. The claim does not constitute *prima facie* evidence of historical use in a change proceeding under §85-2-402, MCA. For example, most water rights decreed for irrigation are not decreed with a volume and provide limited evidence of actual historic beneficial use. §85-2-234, MCA

could not sustain a conclusion of no adverse effect because the applicant failed to provide the Department with evidence of the historic diverted volume, consumption, and return flow); Hohenlohe, at ¶44-45; Town of Manhattan v. DNRC, Cause No. DV-09-872C, Montana Eighteenth Judicial District Court, *Order Re Petition for Judicial Review*, Pgs. 11-12 (proof of historic use is required even when the right has been decreed because the decreed flow rate or volume establishes the maximum appropriation that may be diverted, and may exceed the historical pattern of use, amount diverted or amount consumed through actual use); Matter of Application For Beneficial Water Use Permit By City of Bozeman, *Memorandum*, Pgs. 8-22 (Adopted by DNRC *Final Order* January 9, 1985)(evidence of historic use must be compared to the proposed change in use to give effect to the implied limitations read into every decreed right that an appropriator has no right to expand his appropriation or change his use to the detriment of juniors).⁵

87. An applicant must also analyze the extent to which a proposed change may alter historic return flows for purposes of establishing that the proposed change will not result in adverse effect. The requisite return flow analysis reflects the fundamental tenant of Montana water law that once water leaves the control of the original appropriator, the original appropriator has no right to its use and the water is subject to appropriation by others. E.g., Hohenlohe, at ¶44; Rock Creek Ditch & Flume Co. v. Miller, 93 Mont. 248, 17 P.2d 1074, 1077 (1933); Newton v. Weiler, 87 Mont.

⁵ Other western states likewise rely upon the doctrine of historic use as a critical component in evaluating changes in appropriation rights for expansion and adverse effect: Pueblo West Metropolitan District v. Southeastern Colorado Water Conservancy District, 717 P.2d 955, 959 (Colo. 1986)("[O]nce an appropriator exercises his or her privilege to change a water right ... the appropriator runs a real risk of requantification of the water right based on actual historical consumptive use. In such a change proceeding a junior water right ... which had been strictly administered throughout its existence would, in all probability, be reduced to a lesser quantity because of the relatively limited actual historic use of the right."); Santa Fe Trail Ranches Property Owners Ass'n v. Simpson, 990 P.2d 46, 55 -57 (Colo., 1999); Farmers Reservoir and Irr. Co. v. City of Golden, 44 P.3d 241, 245 (Colo. 2002)("[Colorado Supreme Court] have stated time and again that the need for security and predictability in the prior appropriation system dictates that holders of vested water rights are entitled to the continuation of stream conditions as they existed at the time they first made their appropriation"); Application for Water Rights in Rio Grande County, 53 P.3d 1165, 1170 (Colo. 2002); Wyo. Stat. § 41-3-104 (When an owner of a water right wishes to change a water right ... he shall file a petition requesting permission to make such a change The change ... may be allowed provided that the quantity of water transferred ... shall not exceed the amount of water historically diverted under the existing use, nor increase the historic rate of diversion under the existing use, nor increase the historic amount consumptively used under the existing use, nor decrease the historic amount of return flow, nor in any manner injure other existing lawful appropriators.); Basin Elec. Power Co-op. v. State Bd. of Control, 578 P.2d 557, 564 -566 (Wyo., 1978) (a water right holder may not effect a change of use transferring more water than he had historically consumptively used; regardless of the lack of injury to other appropriators, the amount of water historically diverted under the existing use, the historic rate of diversion under the existing use, the historic amount consumptively used under the existing use, and the historic amount of return flow must be considered.)

164, 286 P. 133(1930); Popham v. Holloron, 84 Mont. 442, 275 P. 1099, 1102 (1929); Galiger v. McNulty, 80 Mont. 339, 260 P. 401 (1927); Head v. Hale, 38 Mont. 302, 100 P. 222 (1909); Spokane Ranch & Water Co., 37 Mont. at 351-52, 96 P. at 731; Hidden Hollow Ranch v. Fields, 2004 MT 153, 321 Mont. 505, 92 P.3d 1185; In the Matter of Application for Change Authorization No. G (W)028708-411 by Hedrich/Straugh/Ringer, DNRC Final Order (Dec. 13, 1991); In the Matter of Application for Change Authorization No. G(W)008323-G76l By Starkel/Koester, DNRC Final Order (Apr. 1, 1992); In the Matter of Application to Change a Water Right No. 41I 30002512 by Brewer Land Co, LLC, DNRC Proposal For Decision and Final Order (2004); Admin. R.M. 36.12.101(56)(Return flow - that part of a diverted flow which is not consumed by the appropriator and returns underground to its original source or another source of water - is not part of a water right and is subject to appropriation by subsequent water users).⁶

88. Although the level of analysis may vary, analysis of the extent to which a proposed change may alter the amount, location, or timing return flows is critical in order to prove that the proposed change will not adversely affect other appropriators who rely on those return flows as part of the source of supply for their water rights. Royston, 249 Mont. at 431, 816 P.2d at 1059-60; Hohenlohe, at ¶¶ 45-6 and 55-6; Spokane Ranch & Water Co., 37 Mont. at 351-52, 96 P. at 731. Noted Montana Water Law scholar Al Stone explained that the water right holder who seeks to change a water right is unlikely to receive the full amount claimed or historically used at the original place of use due to reliance upon return flows by other water users. Montana Water Law, Albert W. Stone, Pgs. 112-17 (State Bar of Montana 1994).

89. In Royston, the Montana Supreme Court confirmed that an applicant is required to prove lack of adverse effect through comparison of the proposed change to the historic use, historic consumption, and historic return flows of the original right. 249 Mont. at 431, 816 P.2d at 1059-60. More recently, the Montana Supreme Court explained the relationship between the fundamental principles of historic beneficial use, return flow, and the rights of subsequent appropriators as they relate to the adverse effect analysis in a change proceeding in the following manner:

The question of adverse effect under §§ 85-2-402(2) and -408(3), MCA, implicates

⁶ The Montana Supreme Court recently recognized the fundamental nature of return flows to Montana's water sources in addressing whether the Mitchell Slough was a perennial flowing stream, given the large amount of irrigation return flow which feeds the stream. The Court acknowledged that the Mitchell's flows are fed by irrigation return flows available for appropriation. Bitterroot River Protective Ass'n, Inc. v. Bitterroot Conservation Dist. 2008 MT 377, ¶¶ 22, 31, 43, 346 Mont. 508, ¶¶ 22, 31, 43, 198 P.3d 219, ¶¶ 22, 31, 43(citing Hidden Hollow Ranch v. Fields, 2004 MT 153, 321 Mont. 505, 92 P.3d 1185).

return flows. A change in the amount of return flow, or to the hydrogeologic pattern of return flow, has the potential to affect adversely downstream water rights. There consequently exists an inextricable link between the “amount historically consumed” and the water that re-enters the stream as return flow. . . .

An appropriator historically has been entitled to the greatest quantity of water he can put to use. The requirement that the use be both beneficial and reasonable, however, proscribes this tenet. This limitation springs from a fundamental tenet of western water law—that an appropriator has a right only to that amount of water historically put to beneficial use—developed in concert with the rationale that each subsequent appropriator “is entitled to have the water flow in the same manner as when he located,” and the appropriator may insist that prior appropriators do not affect adversely his rights.

This fundamental rule of Montana water law has dictated the Department’s determinations in numerous prior change proceedings. The Department claims that historic consumptive use, as quantified in part by return flow analysis, represents a key element of proving historic beneficial use.

We do not dispute this interrelationship between historic consumptive use, return flow, and the amount of water to which an appropriator is entitled as limited by his past beneficial use.

Hohenlohe, at ¶¶ 42-45 (internal citations omitted).

90. The Department’s rules reflect the above fundamental principles of Montana water law and are designed to itemize the type evidence and analysis required for an applicant to meet its burden of proof. Admin.R.M. 36.12.1901 through 1903. These rules forth specific evidence and analysis required to establish the parameters of historic use of the water right being changed. Admin.R.M. 36.12.1901 and 1902. The rules also outline the analysis required to establish a lack of adverse effect based upon a comparison of historic use of the water rights being changed to the proposed use under the changed conditions along with evaluation of the potential impacts of the change on other water users caused by changes in the amount, timing, or location of historic diversions and return flows. Admin.R.M. 36.12.1901 and 1903.

91. Applicant seeks to change existing water rights represented by its Water Right Claims. The “existing water rights” in this case are those as they existed prior to July 1, 1973, because with limited exception, no changes could have been made to those rights after that date without the Department’s approval. Analysis of adverse effect in a change to an “existing water right” requires evaluation of what the water right looked like and how it was exercised prior to July 1, 1973. In McDonald v. State, the Montana Supreme Court explained:

The foregoing cases and many others serve to illustrate that what is preserved to owners of appropriated or decreed water rights by the provision of the 1972 Constitution is what the law has always contemplated in this state as the extent of

a water right: such amount of water as, by pattern of use and means of use, the owners or their predecessors put to beneficial use. . . . the Water Use Act contemplates that all water rights, regardless of prior statements or claims as to amount, must nevertheless, to be recognized, pass the test of historical, unabandoned beneficial use. . . . To that extent only the 1972 constitutional recognition of water rights is effective and will be sustained.

220 Mont. at 529, 722 P.2d at 604; see also Matter of Clark Fork River Drainage Area, 254 Mont. 11, 17, 833 P.2d 1120 (1992).

92. Water Resources Surveys were authorized by the 1939 legislature. 1939 Mont. Laws Ch. 185, § 5. Since their completion, Water Resources Surveys have been invaluable evidence in water right disputes and have long been relied on by Montana courts. In re Adjudication of Existing Rights to Use of All Water in North End Subbasin of Bitterroot River Drainage Area in Ravalli and Missoula Counties, 295 Mont. 447, 453, 984 P.2d 151, 155 (1999)(Water Resources Survey used as evidence in adjudicating of water rights); Wareing v. Schreckendgust, 280 Mont. 196, 213, 930 P.2d 37, 47 (1996)(Water Resources Survey used as evidence in a prescriptive ditch easement case); Olsen v. McQueary, 212 Mont. 173, 180, 687 P.2d 712, 716 (1984) (judicial notice taken of Water Resources Survey in water right dispute concerning branches of a creek).

93. While evidence may be provided that a particular parcel was irrigated, the actual amount of water historically diverted and consumed is critical. E.g., In the Matter of Application to Change Water Right No. 41H 1223599 by MGRR #1, LLC., DNRC Proposal for Decision adopted by Final Order (2005). The Department cannot assume that a parcel received the full duty of water or that it received sufficient water to constitute full service irrigation for optimum plant growth. Even when it seems clear that no other rights could be affected solely by a particular change in the location of diversion, it is essential that the change also not enlarge an existing right. See MacDonald, 220 Mont. at 529, 722 P.2d at 604; Featherman, 43 Mont. at 316-17, 115 P. at 986; Trail's End Ranch, L.L.C. v. Colorado Div. of Water Resources 91 P.3d 1058, 1063 (Colo., 2004).

94. The Department has adopted a rule providing for the calculation of historic consumptive use where the applicant proves by a preponderance of the evidence that the acreage was historically irrigated. Admin. R. M. 36.12.1902 (16). In the alternative an applicant may present its own evidence of historic beneficial use. In this case Applicant has elected to proceed under Admin. R.M. 36.12.1902. (FOF No. 20).

95. If an applicant seeks more than the historic consumptive use as calculated by Admin.R.M .36.12.1902 (16), the applicant bears the burden of proof to demonstrate the amount of historic

consumptive use by a preponderance of the evidence. The actual historic use of water could be less than the optimum utilization represented by the calculated duty of water in any particular case. E.g., Application for Water Rights in Rio Grande County 53 P.3d 1165 (Colo., 2002) (historical use must be quantified to ensure no enlargement); In the Matter of Application to Change Water Right No. 41H 1223599 by MGRR #1, LLC., supra; Orr v. Arapahoe Water and Sanitation Dist. 753 P.2d 1217, 1223 -1224 (Colo., 1988)(historical use of a water right could very well be less than the duty of water); Weibert v. Rothe Bros., Inc., 200 Colo. 310, 317, 618 P.2d 1367, 1371 - 1372 (Colo. 1980) (historical use could be less than the optimum utilization “duty of water”).

96. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 110336 00 of 64.41 AF diverted volume and 0.84 CFS flow rate with a consumptive use of 33.37 acre-feet. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 110337 00 of 377.24 AF diverted volume and 4.92 CFS flow rate with a consumptive use of 195.45 acre-feet. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 110338 00 of 205.49 AF diverted volume and 2.68 CFS flow rate with a consumptive use of 106.47 acre-feet. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 110339 00 of 159.48 AF diverted volume and 2.08 CFS flow rate with a consumptive use of 82.63 acre-feet. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 110340 00 of 95.84 AF diverted volume and 1.25 CFS flow rate with a consumptive use of 49.66 acre-feet. Based upon the Applicant’s evidence of historic use, the Applicant has proven by a preponderance of the evidence the historic use of Water Right Claim No. 41H 132779 00 of 383.37 AF diverted volume and 5.00 CFS flow rate with a consumptive use of 198.63 acre-feet. (FOF Nos. 15-32)

97. Based upon the Applicant’s comparative analysis of historic water use and return flows to water use and return flows under the proposed change, the Applicant has proven that the proposed change in appropriation right will not adversely affect the use of the existing water rights of other persons or other perfected or planned uses or developments for which a permit or

certificate has been issued or for which a state water reservation has been issued. §85-2-402(2)(b), MCA. (FOF Nos. 33-67)

BENEFICIAL USE

98. A change applicant must prove by a preponderance of the evidence the proposed use is a beneficial use. §§85-2-102(4) and -402(2)(c), MCA. Beneficial use is and has always been the hallmark of a valid Montana water right: “[T]he amount actually needed for beneficial use within the appropriation will be the basis, measure, and the limit of all water rights in Montana . . .” McDonald, 220 Mont. at 532, 722 P.2d at 606. The analysis of the beneficial use criterion is the same for change authorizations under §85-2-402, MCA, and new beneficial permits under §85-2-311, MCA. Admin.R.M. 36.12.1801. The amount of water that may be authorized for change is limited to the amount of water necessary to sustain the beneficial use. E.g., Bitterroot River Protective Association v. Siebel, *Order on Petition for Judicial Review*, Cause No. BDV-2002-519, Montana First Judicial District Court (2003) (*affirmed on other grounds*, 2005 MT 60, 326 Mont. 241, 108 P.3d 518); Worden v. Alexander, 108 Mont. 208, 90 P.2d 160 (1939); Allen v. Petrick, 69 Mont. 373, 222 P. 451(1924); Sitz Ranch v. DNRC, DV-10-13390, Montana Fifth Judicial District Court, *Order Affirming DNRC Decision*, Pg. 3 (2011)(citing BRPA v. Siebel, 2005 MT 60, and rejecting applicant’s argument that it be allowed to appropriate 800 acre-feet when a typical year would require 200-300 acre-feet); Toohy v. Campbell, 24 Mont. 13, 60 P. 396 (1900)(“The policy of the law is to prevent a person from acquiring exclusive control of a stream, or any part thereof, not for present and actual beneficial use, but for mere future speculative profit or advantage, without regard to existing or contemplated beneficial uses. He is restricted in the amount that he can appropriate to the quantity needed for such beneficial purposes.”); §85-2-312(1)(a), MCA (DNRC is statutorily prohibited from issuing a permit for more water than can be beneficially used).

99. Applicant proposes to continue to use water for irrigation which is a recognized beneficial use. §85-2-102(5), MCA. For the temporary change, Applicant has proven by a preponderance of the evidence irrigation is a beneficial use and that 495.13 acre-feet of diverted volume and 5 CFS flow rate of water requested is the amount needed to sustain the beneficial use for 384 acres while using the proposed point of diversion and is within the standards set by DNRC Rule. §85-2-402(2)(c), MCA. Applicant proposes to use water for instream fishery which is a recognized beneficial use. §85-2-102(5), MCA. Applicant has proven by a preponderance of the evidence

instream fishery is a beneficial use and that 246.62 acre-feet of volume and 2.04 CFS flow rate of water requested is the amount needed to sustain the beneficial use and is within the standards set by DNRC Rule. §85-2-402(2)(c), MCA (FOF Nos. 68-72)

ADEQUATE MEANS OF DIVERSION

Permanent Additional Point of Diversion

100. Pursuant to §85-2-402 (2)(b), MCA, the Applicant must prove by a preponderance of the evidence that the proposed means of diversion, construction, and operation of the appropriation works are adequate. This codifies the prior appropriation principle that the means of diversion must be reasonably effective for the contemplated use and may not result in a waste of the resource. Crowley v. 6th Judicial District Court, 108 Mont. 89, 88 P.2d 23 (1939); In the Matter of Application for Beneficial Water Use Permit No. 41C-11339900 by Three Creeks Ranch of Wyoming LLC (DNRC Final Order 2002)(information needed to prove that proposed means of diversion, construction, and operation of the appropriation works are adequate varies based upon project complexity; design by licensed engineer adequate).

101. Pursuant to §85-2-402 (2)(b), MCA, applicant has proven by a preponderance of the evidence that the proposed means of diversion, construction, and operation of the appropriation works are adequate for the proposed beneficial use. (FOF Nos. 73-74)

Temporary Instream Flow Purpose

102. Pursuant to §85-2-402 (2)(b), MCA, the Applicant is not required to prove that the proposed means of diversion, construction, and operation of the appropriation works are adequate because this application involves a (ii) a temporary change in appropriation right for instream flow pursuant to 85-2-408.

POSSESSORY INTEREST

Permanent Additional Point of Diversion

103. Pursuant to §85-2-402(2)(d), MCA, the Applicant must prove by a preponderance of the evidence that it has a possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use. See also Admin.R.M. 36.12.1802

104. The Applicant has proven by a preponderance of the evidence that it has a possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use. (FOF Nos. 75-76)

Temporary Instream Flow Purpose

105. Pursuant to §85-2-402(2)(d), MCA, the applicant is not required to prove that it has a possessory interest, or the written consent of the person with the possessory interest, in the property where the water is to be put to beneficial use because this application involves a (ii) a temporary change in appropriation right for instream flow pursuant to §85-2-408 MCA.

INSTREAM FLOW CHANGE REQUIREMENTS

106. The Department shall accept and process an application for a change in appropriation rights to protect, maintain, or enhance streamflows to benefit the fishery resource under §§ 85-2-402 and -436, MCA. An application for a change authorization for instream flow under § 85-2-436, MCA, shall:

(3) (c) include specific information on the length and location of the stream reach in which the streamflow is to be protected, maintained, or enhanced and must provide a detailed streamflow measuring plan that describes the points where and the manner in which the streamflow must be measured. (§ 85-2-436(3)(c), MCA)

107. Section 85-2-436(3)(d), MCA, provides:

The maximum quantity of water that may be changed to instream flow is the amount historically diverted. However, only the amount historically consumed, or a smaller amount if specified by the department in the change in appropriation right authorization, may be used to protect, maintain, or enhance streamflows below the point of diversion that existed prior to the change in appropriation right.

Pursuant to the District Court decision in *Hohenlohe v. DNRC*, Cause No. BDV-2008-750, Montana First Judicial District (June 10, 2009), *aff'd*, *Hohenlohe v. DNRC*, 2010 MT 203, an applicant in a change in appropriation right proceeding for instream flow can protect the full historic diverted flow rate and volume in certain circumstances. The full historic diverted amount (flow and volume) can be protected to the extent it does not return to the watercourse within the protected reach and it returns to those appropriators who rely on the return flow in accordance with the adverse effect criterion §85-2-402(2)(a), MCA. *Hohenlohe*, ¶¶ 42, 67 - 70. The

determination under § 85-2-436(3)(d), MCA, as to the amount protected is within the Department's discretion. Id. at ¶¶ 37, 39. The Department has the discretion under appropriate circumstances to limit or reduce that portion suitable for instream flow from the amount historically diverted to the amount historically consumed, or a smaller amount. Id. at ¶¶ 67-69; § 85-2-436(3)(d), MCA.

108. The Applicant has provided a measurement plan and specific information on the stream reach to be protected that meet the requirements of § 85-2-436(3), MCA. (FOF Nos. 77-83)

PRELIMINARY DETERMINATION

Subject to the terms and analysis in this Preliminary Determination Order, the Department preliminarily determines that this Application to Change Water Right No. 41H 30118754 should be GRANTED subject to the following.

The permanent change to Water Right Claim Nos. 41H 110336 00, 41H 110337 00, 41H 110338 00, 41H 110339 00, 41H 110340 00, and 41H 132779 00 will be an additional point of diversion at a pump system on the East Gallatin River, at SWSWNE Section 4, T1S, R5E, Gallatin County. No other permanent changes to the water rights exist.

The temporary change Water Right Claim Nos. 41H 110336 00, 41H 110337 00, 41H 110338 00, 41H 110339 00, 41H 110340 00, and 41H 132779 00 will include: 132.68 retired acres, 384 irrigated acres, an additional instream fishery purpose, and an additional place of use for the Protected Reach between NWSWSE Section 10, T1S R5E and SWSWNE Section 32, T1N R5E in the East Gallatin River. The historic diverted volume that can be protected to the historic point of diversion is 11.77 CFS and 666.94 AF volume across the period of use when the historic point of diversion is not in use and 11.77 CFS and 251.39 AF volume across the period of use when the historic point of diversion is in use. The instream flow operation plan protects 2.04 CFS for 61 days in the period of use, totaling 246.62 AF, along the Protected Reach when the historic point of diversion is not in use and 1.62 CFS for 61 days in the period of use, totaling 196.63 AF, when the historic point of diversion is in use. The Protected Reach runs along the East Gallatin River from the historic point of diversion at NWSWSE Section 10, T1S R5E to the confluence with Hyalite Creek at SWSWNE Section 32, T1 North, R5E, Gallatin County. The following tables show all elements of the changed water rights: Table 41 (Permanent Change), Table 42 (Temporary Change, Scenario 1), and Table 43 (Temporary Change, Scenario 2).

Table 41. Permanent Change Coding

Permanent Change							
WR #	Purpose	CFS	PCV (AF)	PDV (AF)	POD	POU	Period
41H 110336 00	Irrigation	0.84	33.37	64.41	1) NWSWSE Sec 10 T1S R5E Gallatin (headgate); 2) SWSWNE Sec 4 T1S R5E Gallatin (pump)	Sec 3 & 4, T1S R5E, Gallatin (516.7 acres)	5/01-10/31
41H 110337 00	Irrigation	4.92	195.45	377.24			
41H 110338 00	Irrigation	2.68	106.47	205.49			
41H 110339 00	Irrigation	2.08	82.63	159.48			
41H 110340 00	Irrigation	1.25	49.66	95.84			
41H 132779 00	Irrigation	5.00	198.63	383.37			5/01-11/01

Table 42. Temporary Change, Scenario 1 (Historic POD and ditch not in use, Instream Fishery volumes protectable along the Protected Reach). Scenario 1 represents maximum flow rate and volume for instream flows for the temporary change

Temporary Change: Scenario 1							
WR #	Purpose	CFS	PCV (AF)	PDV (AF)	POD	POU	Period
41H 110336 00	Irrigation	0.25	24.8	51.82	1) NWSWSE Sec 10 T1S R5E Gallatin (headgate); 2)SWSWNE Sec 4 T1S R5E Gallatin (pump)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	5/01-10/31
	Instream Fishery	0.10	12.35		3)NWSWSE Sec 10 T1S R5E Gallatin (instream)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110337 00	Irrigation	1.47	145.26	303.49	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.60	72.35		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110338 00	Irrigation	0.80	79.13	165.32	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.33	39.41		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110339 00	Irrigation	0.62	61.41	128.31	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.25	30.59		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110340 00	Irrigation	0.37	36.91	77.11	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.15	18.38		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 132779 00	Irrigation	1.49	147.62	308.43	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	5/01-11/01
	Instream Fishery	0.61	73.53		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	

Table 43. Temporary Change, Scenario 2 (Historic POD and ditch in use, Instream Fishery volumes protectable along the Protected Reach). Scenario 2 represents maximum flow rate and volume for irrigation purpose for temporary change.

Temporary Change: Scenario 2							
WR #	Purpose	CFS	PCV (AF)	PDV (AF)	POD	POU	Period
41H 110336 00	Irrigation	0.84	24.8	51.82	1) NWSWSE Sec 10 T1S R5E Gallatin (headgate); 2)SWSWNE Sec 4 T1S R5E Gallatin (pump)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	5/01-10/31
	Instream Fishery	0.08	9.85		3)NWSWSE Sec 10 T1S R5E Gallatin (instream)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110337 00	Irrigation	4.92	145.26	303.49	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.48	57.69		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110338 00	Irrigation	2.68	79.13	165.32	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.26	31.42		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110339 00	Irrigation	2.08	61.41	128.31	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.20	24.39		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 110340 00	Irrigation	1.25	36.91	77.11	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	
	Instream Fishery	0.12	14.66		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	
41H 132779 00	Irrigation	5.00	147.62	308.43	1) and 2)	Sec 3 & 4, T1S R5E, Gallatin (384 acres)	5/01-11/01
	Instream Fishery	0.48	58.62		3)	NWSWSE Sec 10, T1S R5E, Gallatin to SWSWNE Sec 32, T1N R5E, Gallatin	

This Authorization is subject to the following conditions, limitation, or restrictions:

WATER MEASUREMENT RECORDS REQUIRED

The Applicant or a designee shall measure the Protected Reach according to the measurement plan authorized in the Preliminary Determination Order using Department-approved measuring devices. Measurement records shall be made available to the Department upon request. The appropriator shall maintain the measuring devices, so they always operate properly and measure flow rate accurately.

Two measurement locations shall be selected that have suitable conditions and are as close as possible to the following points coinciding with the start and end of the Protected Reach: NWSWSE Section 10, T1S R5E and SWSWNE Section 32, T1 North, R5E, Gallatin County. Applicant shall take a minimum of two measurements annually during the period of use, focusing on low flow conditions between July 15 and October 15.

INSTREAM FISHERY OPERATION PLAN REQUIRED

The Applicant shall implement an operation plan to ensure the following maximum protected instream fishery flow rates and volumes are not exceeded (Table 44 and Table 45):

Table 44. Operation Plan, Ditch Not in Use, by Month (left) and by Water Right (right)

Scenario 1.2 (DNRC): Flannery Ditch not in use: 246.62 AF (HCV) Protectable				
(CFS)	CFS to AF/day	AF/day	Days	AF/Year
2.04	1.98	4.04	61	246.4
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	2.04	60.6	
August	31	2.04	125.2	
September	15	2.04	60.6	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			246.4	

	Historic Flow Rate	Proportion	ISF Flow Rate	ISF Volume
41H 110336 00	0.84	0.05	0.10	12.3
41H 110337 00	4.92	0.29	0.60	72.3
41H 110338 00	2.68	0.16	0.33	39.4
41H 110339 00	2.08	0.12	0.25	30.6
41H 110340 00	1.25	0.07	0.15	18.4
41H 132779 00	5.00	0.30	0.61	73.5
	16.77		2.04	246.4

Table 45. Operation Plan, Ditch in Use, by Month (left) and by Water Right (right)

Scenario 2 (DNRC): Flannery Ditch in use: 196.63 AF (HCV) Protectable				
(CFS)	CFS to AF/day	AF/day	Days	AF/Year
1.62	1.98	3.21	61	195.7
	Days/Mo	CFS	AF/Mo	
January	0	0	0	
February	0	0	0	
March	0	0	0	
April	0	0	0	
May	0	0	0	
June	0	0	0	
July	15	1.62	48.1	
August	31	1.62	99.4	
September	15	1.62	48.1	
October	0	0	0	
November	0	0	0	
December	0	0	0	
			195.7	

	Historic Flow Rate	Proportion	ISF Flow Rate	ISF Volume
41H 110336 00	0.84	0.05	0.08	9.8
41H 110337 00	4.92	0.29	0.48	57.4
41H 110338 00	2.68	0.16	0.26	31.3
41H 110339 00	2.08	0.12	0.20	24.3
41H 110340 00	1.25	0.07	0.12	14.6
41H 132779 00	5.00	0.30	0.48	58.3
	16.77		1.62	195.7

POINT OF DIVERSION OPERATION TO PREVENT EXPANSION

Point of diversion at headgate and point of diversion at pumps shall not be used at the same time.

NOTICE

This Department will provide public notice of this Application and the Department's Preliminary Determination to Grant pursuant to §85-2-307, MCA. The Department will set a deadline for objections to this Application pursuant to §§85-2-307, and -308, MCA. If this Application receives a valid objection, it will proceed to a contested case proceeding pursuant to Title 2 Chapter 4 Part 6, MCA, and §85-2-309, MCA. If this Application receives no valid objection or all valid objections are unconditionally withdrawn, the Department will grant this Application as herein approved. If this Application receives a valid objection(s) and the valid objection(s) are conditionally withdrawn, the Department will consider the proposed condition(s) and grant the Application with such conditions as the Department decides necessary to satisfy the applicable criteria. E.g., §§85-2-310, -312, MCA.

DATED this 26th day of January 2023.

/Original signed by Kerri Strasheim/
Kerri Strasheim, Manager
Bozeman Regional Office
Department of Natural Resources
and Conservation

CERTIFICATE OF SERVICE

This certifies that a true and correct copy of the PRELIMINARY DETERMINATION TO GRANT was served upon all parties listed below on this 26th day of January 2023, by first class United States mail.

SPAIN BRIDGE MEADOWS LLC
PO BOX 11938
BOZEMAN, MT 59719

(VIA EMAIL)

TROUT UNLIMITED
% MEGAN CASEY
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